UTAH STATE IMPLEMENTATION PLAN

SECTION IX, PART A

FINE PARTICULATE MATTER (PM_{10})

Adopted by the Air Quality Board
July 3, 2002

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FINE PARTICULATE MATTER (PM_{10})

IX.A.1 AREA DESIGNATION BACKGROUND

The Wasatch Front Intrastate Air Quality Control Region (AQCR), comprised of Davis, Salt Lake, Utah, and Weber Counties was designated by the Environmental Protection Agency (EPA) as a non-attainment area for total suspended particulate matter (TSP) in accordance with the requirements of Section 107, Clean Air Act as amended August 1977. In 1981, the nonattainment areas were redefined as the actual areas of nonattainment and only those portions of each of the four counties in which monitored and/or modeled data showed that ambient concentrations exceed the National Ambient Air Quality Standard (NAAQS) for TSP were designated as nonattainment areas. In 1983, Davis and Weber Counties were redesignated as attainment areas for TSP.

In 1987, EPA determined that only those particulates with a diameter of ten microns or less (PM_{10}) penetrate into the respiratory tract sufficiently deep to cause a health impact. There are primary and secondary sources of PM_{10}. Primary sources are those which emit PM_{10} directly into the atmosphere from chemical, mechanical, or combustion processes. Secondary PM_{10} particles form from the reactions of SO_2 and NO_x emitted to the atmosphere to form sulfates and nitrates. These secondary sulfates and nitrates are measured at monitoring stations as PM_{10}.

On July 1, 1987, EPA promulgated a new NAAQS for PM_{10} and required the submittal of a State Implementation Plan for those areas not meeting the standards. The 24-Hour NAAQS for PM_{10} is 150 $\mu g/m^3$ and it allows up to three exceedances of the standard in any three-year period. Based on historical TSP data, EPA listed Salt Lake and Utah Counties as Group I areas for PM_{10}, which indicated that there was at least a 95% probability that those areas would exceed the new PM_{10} standard. The remainder of the State was listed as Group III, indicating less than a 20% probability of exceeding the PM_{10} standard.

Monitoring data confirms that Salt Lake and Utah Counties exceed the NAAQS for PM_{10}. The State will continue to evaluate the adequacy of the existing ambient air monitoring network described in "Air Quality Surveillance", Section 4 of the SIP. The program will be updated as necessary, to include any revisions of applicable federal regulations and assure attainment of NAAQS for PM_{10}.

The Clean Air Act Amendments of 1990 redesignated the Salt Lake and Utah County Group I areas as non-attainment areas, and required the submittal of a State Implementation Plan which requires the installation of Reasonable Available Control Measures (RACM) on industrial sources impacting the nonattainment areas, and demonstrates attainment of the standard no later than December 31, 1994.

The design value is the ambient pollutant concentration from which this plan must reduce to meet the NAAQS and may be determined by using the actual observed concentrations in the nonattainment area during a specified period of time. The determination of the design value is dependent on the number of days that ambient PM_{10} data were collected during the three-year period, and the data used must be contained in discreet 12-month periods (i.e., 12, 24, or 36-month periods of data collection). This is discussed in more detail in IX.A.4.b. below.

IX.A.2 PM_{10} CONCENTRATIONS

Ambient monitoring data has confirmed that violations of the NAAQS occur in Salt Lake and Utah Counties. Table IX.A.1 below shows the numbers of exceedances measured in Utah and Salt Lake Counties since 1985. It also shows the months when the exceedances occurred. As can be seen, most of the exceedances occur during the winter months. During the winter, extremely strong temperature inversions develop which trap PM_{10} particles and all other pollutants in a layer near the ground. The exception to this winter scenario is the occasional wind storm which can cause blowing dust. The exceedances which occurred at the Magna monitoring site are examples of this condition.

DISTRIBUTION OF EXCEEDANCES

STATION	YEAR	JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
LINDON	85			0	0	0	0	0	0	0	0	0	7	7
LINDON	86	6	0	0	0	0	0	0	0	0	0	0	0	6
LINDON	87	0	0	0	0	0	0	0	0	0	0	0	0	0
LINDON	88	5	5	0	0	0	0	0	0	0	0	0	6	16
LINDON	89	11	7	0	0	0	0	0	0	0	0	0	2	20
LINDON	90	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH PV	86	1	0	0	0	0	0	0	0	0	0	0	0	1
NORTH PV	87	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH PV	88	1	1	0	0	0	0	0	0	0	0	0	0	2
NORTH PV	89	1	0	0	0	0	0	0	0	0	0	0	1	2
NORTH PV	90	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST OREM	88										0	0	3	3
WEST OREM	89	7	6	0	0	0	0	0	0	0	0	0	2	15
WEST OREM	90	0	0	0	0	0	0	0	0	0	0	0	0	0
SALT LAKE	87							0	0	0	0	0	0	0
SALT LAKE	88	1	0	0	0	0	0	0	0	1	0	0	1	3
SALT LAKE	89	2	1	0	0	0	0	0	0	0	0	0	0	3
SALT LAKE	90	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH SL	85										0	0	1	1
NORTH SL	86	1	0	0	0	1	1	0	0	0	0	0	0	3
NORTH SL	87	0	0	0	0	0	0	0	0	0	0	0	0	0
NORTH SL	88	1	1	0	1	1	0	0	0	0	0	0	3	7
NORTH SL	89	2	1	0	0	0	0	0	0	0	0	0	0	3
NORTH SL	90	0	0	0	0	0	0	0	0	0	0	0	0	0
AMC	89	5	1	0	0	0	0	0	0	0	0	0	1	7
AMC	90	0	0	0	0	0	0	0	0	0	0	0	0	0
MAGNA	85						1	1	1	0	0	0	0	3
MAGNA	86	0	0	0	0	1	0	2	0	0	0	0	0	3
MAGNA	87	0	0	0	1	0	1	0	0	0	0	0	0	2
MAGNA	88	0	0	1	1	0	0	0	0	0	0	0	0	2
MAGNA	89	0	0	0	0	0	0	0	0	0	0	0	0	0
MAGNA	90	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE IX.A.1

Because the violations of the PM_{10} standard in the nonattainment areas are caused by different conditions, and because each of the conditions must be resolved in a different manner, this plan will address the ambient data, design value, and source apportionments for each of the monitoring sites in Utah County nonattainment area, the Magna portion of the Salt Lake nonattainment area, and the remainder of the Salt Lake nonattainment area separately, and then address the control strategies for the entire Wasatch Front. As is demonstrated later in this document, because the exceedances in Salt Lake County are monitored in northern Salt Lake County, and because modeling indicates that sources of PM_{10} and its precursors in Davis County impact the Salt Lake nonattainment area, for purposes of this SIP, controls required in the Salt Lake nonattainment area will be required in Davis County.

IX.A.3 UTAH COUNTY

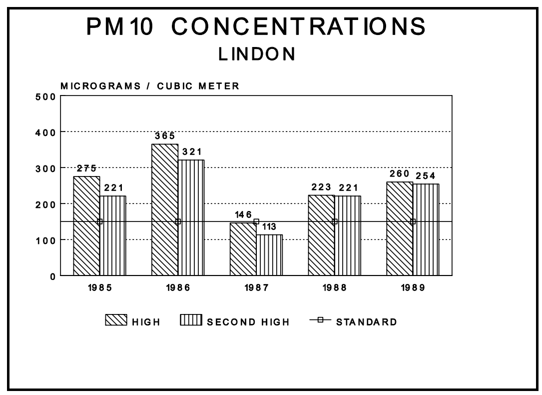
The documentation for the development of the emissions inventory, the Chemical Mass Balance model (CMB), MOBILE6 and other mobile emissions, and control strategy effectiveness for the July 3, 2002 revision to the Utah County portion of the PM_{10} SIP are contained in Supplement II-02 of the Technical Support Document. Detailed calculations for each sector of the emissions inventory for 2002, 2003 (and, for purposes of conformity, 2010 and 2020) are contained in Supplement II-02 of the TSD. These calculations document current planning assumptions about growth, current and projected controls, banked emissions relied upon in the attainment demonstration, etc. used in the projections. The Table of Contents of Supplement II-02 identifies where each sector is documented.

IX.A.3.a. Ambient Data

Because the exceedances of the PM_{10} standard only occur during winter inversion periods in Utah County, it is appropriate to look at winter seasons to determine the controls which may be necessary to reduce ambient PM_{10} concentrations to levels which are below the standard of 150 $\mu g/m^3$.

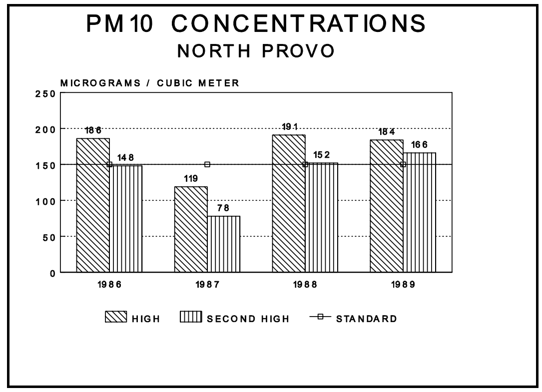
LINDON

Figure IX.A.1 shows the ambient PM_{10} concentrations measured at the Lindon monitoring station. As shown, the PM_{10} standard is exceeded in Lindon. Data from the most recent 24-month period (April, 1988, through March, 1990) will be used in the determination of the Lindon design value. There are no exceedances in the January-April, 1990 period.



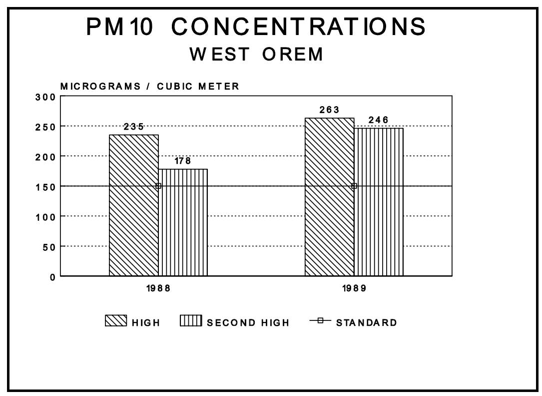
NORTH PROVO

Figure IX.A.2 shows the ambient PM_{10} concentrations which were measured at the North Provo monitoring station. As can be seen, the standard for PM_{10} is exceeded in North Provo. Data from the most recent 24-month period (April, 1988, through March, 1990) will be used in the determination of the design value for the North Provo monitoring site. There are no exceedances in the January-April, 1990 period.



WEST OREM

Collection of PM_{10} data began at the West Orem monitoring site in October of 1988, and a complete year of data has since been collected. Figure IX.A.3 shows a summary of the ambient PM_{10} concentrations which were measured in West Orem. Data from the 12-month period from January through December of 1989 is used to allow the consideration of data from two separate winter seasons in the determination of the design value for West Orem. This will improve the reliability of this plan.



IX.A.3.b. Design Value Determination:

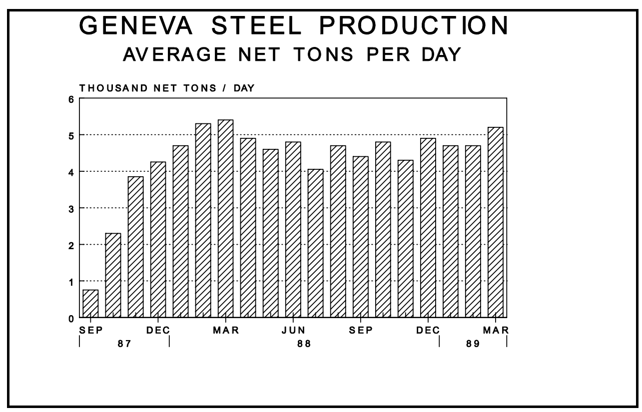
The design value is the PM_{10} concentration that becomes the reference point from which emissions of PM_{10} must be reduced in order to demonstrate attainment of the NAAQS at each monitoring site where violations of the NAAQS occur. As shown above, the Bureau of Air Quality is required to develop an independant design value for each of the monitoring sites in Utah County (i.e., Lindon, North Provo, and West Orem).

Because ambient monitoring data may not be collected each day or may not be collected at the point of highest concentration where the public has access, EPA guidance for PM_{10} SIP preparation normally requires the use of computer modeling to determine the design value. Computer modeling may also be used to verify that the observed pollution levels were the highest which could occur in the area under "worse case" meteorological conditions. If the model indicates that levels higher than those observed might occur, then those modeled values must be used to determine the design value.

One method of determining the design value is the application of dispersion modeling using the emission rates which sources of particulate matter are legally allowed to emit. In many cases the allowed emission rate may be significantly different than the actual emission rate of sources operating normally.

Considerable time and effort was spent by the Bureau of Air Quality in calibrating the computer model recommended by EPA to match the monitored data, and modeling the allowed emission rates. The Bureau was allowing wind speeds to approach 0.2 meters per second to simulate winter inversion conditions since violations of the NAAQS routinely occur under such conditions. This technique showed very good agreement between model predictions, chemical mass balance (CMB) source apportionment analysis, and measured ambient PM_{10} concentrations, but the wind speeds which were used were below the EPA modeling requirements of one meter per second. As the process neared completion, EPA determined that the modeling protocol the Bureau was using did not meet the modeling guideline requirements, and EPA required the use of other methods to determine the design value.

EPA's disapproval of the dispersion model made it necessary to use actual measured PM_{10} concentrations to determine the design values. EPA's guidance on determining a design value using measured concentrations requires that the data record used in developing the design value should be a period when point source and area source emission rates are relatively constant and indicative of the usual condition. Since Geneva Steel was closed from August 1986 through September of 1987, and was in a "start-up" mode until March, 1988, the entire data record cannot be used to determine appropriate design values. Geneva Steel is the major Utah County point source of primary PM_{10} particulate and a substantial point source of gaseous sulfur and nitrogen emissions which become secondary PM_{10} particulate. In addition to the concerns presented by the closure of the steel mill, a concern exists that some components of the secondary PM_{10} particles, primarily the nitrates, may have been lost through sublimation from the ambient monitoring filters used to characterize PM_{10} concentrations in the early PM_{10} monitoring efforts. These two concerns dictate that the most recent data be used in determining the design values.



In using the most recent data we must be sure that one of the major sources, Geneva Steel, was operating at their normal capacity in order to have a valid data set. Figure IX.A.4 shows Geneva's production rate since they began operation in September of 1987. As can be seen, the plant was not in full production by December of that year, and discussions with the company have indicated that the plant was in the "start-up" mode until March, 1988; therefore, ambient PM_{10} data collected since April of 1988 can be used in determining the design value.

To ensure that each season of the year is represented by the data used in determining the design value, EPA requires the use of complete discrete 12-month data sets or sets which are multiples of 12-month periods.

In using the actual ambient data in determining the design value, the number of days of valid data collected is very important because some days of data may be missing which could have shown a violation of the PM_{10} standard had data been collected for that day. To assist in addressing this problem, EPA's Guideline Document contains a look-up table to be used in determining the design value if ambient monitoring data is used. Table IX.A.2 is a copy of the look-up table.

ESTIMATION OF PM_{10} DESIGN CONCENTRATIONS

NUMBER OF DAILY VALUES	DATA POINT USED FOR DESIGN CONCENTRATION
< 347	Highest Value
348 - 695	Second Highest Value
696 - 1042	Third Highest Value
1043 - 1096	Fourth Highest Value

Table IX.A.2

LINDON

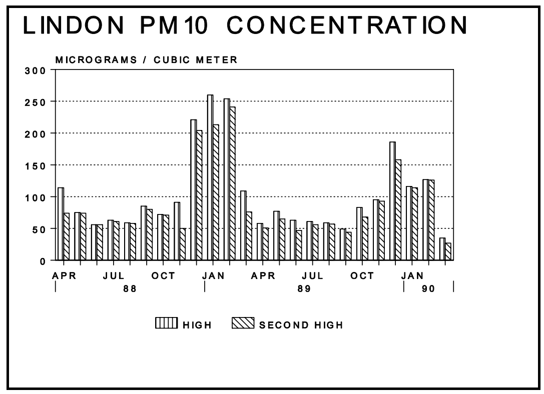


Figure IX.A.5 shows a summary of the PM_{10} data collected at the Lindon monitoring station during the period from April, 1988, through March, 1990. The total number of days of data available during that period is 666 which is in the range of Table IX.A.2 which allows the use of the second highest observed concentration as the design value. The second highest value is 254 µg/m^3 which was measured on February 18, 1989, and is the design value for the Lindon monitor.

NORTH PROVO

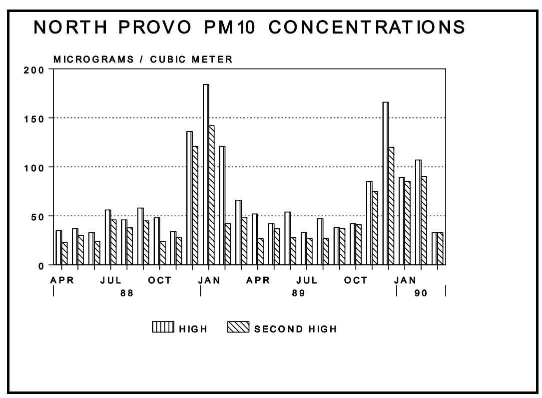
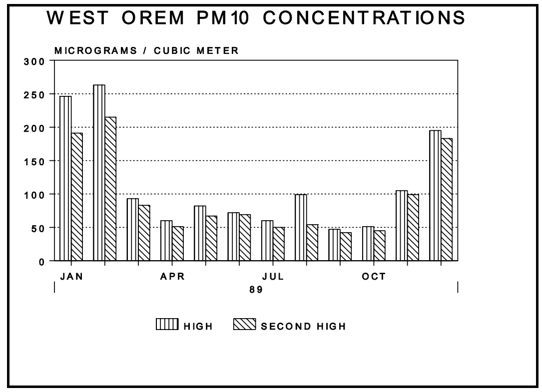


Figure IX.A.6 shows a summary of the PM_{10} data collected at the North Provo monitoring station during the period from April, 1988, through March, 1990. The total number of days of data available during this monitoring period is 226. This number is less than 347 in Table IX.A.2, indicating that the highest value is to be used as the design value. The highest value is 191 µg/m^3 which was measured on January 28, 1988, and is the design value for the North Provo monitor.

WEST OREM

PM_{10} Data collection began at West Orem in October, 1988, and a complete year of data has been collected. Figure IX.A.7 shows a summary of the PM_{10} data collected at West Orem from January through December, 1989. The number of days of data that were collected at the West Orem Station during the discrete 12-month period from January 1 through December 31, 1989 is 339, which is in the "less than 347" category in Table IX.A.2 above. Therefore, the highest value should be used as the design value. The highest value at West Orem is 263 $\mu g/m^3$ which was measured on February 17, 1989 and is the design value for West Orem.

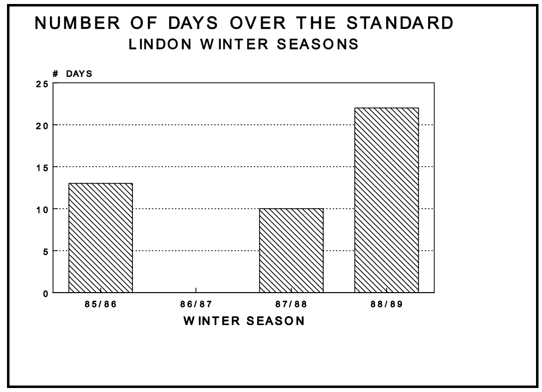


UTAH COUNTY NONATTAINMENT AREA

EPA requires that the highest design value in a PM_{10} nonattainment area be used in determining the amount of reduction that is necessary to attain the standard, and that the plan demonstrate attainment at all monitoring sites on all days which violate the standard. Since 263 $\mu g/m^3$ is 113 $\mu g/m^3$ above the standard, a 43% reduction of PM_{10} emissions is necessary in the nonattainment area (i.e., [113/263] x 100) to attain the standard. Knowing the amount of reduction that is needed is essential in determining the control strategies that must be implemented to achieve that reduction.

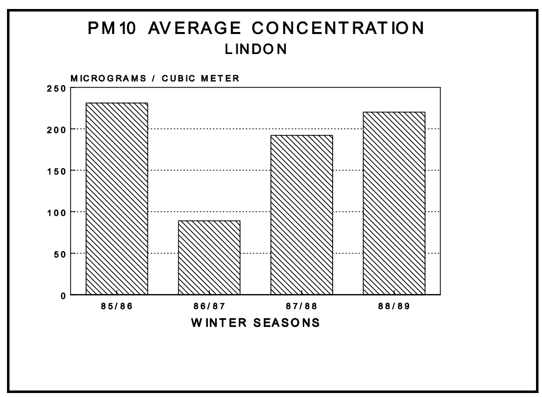
IX.A.3.c. Source Apportionment Methodology:

UP-DOWN-UP ANALYSIS

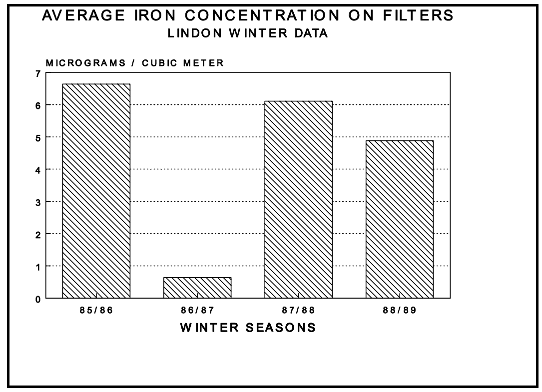


A review of the Lindon PM_{10} monitoring data displayed graphically in Figures IX.A.8 and IX.A.9 indicates a major difference in data for the winter of 1986-87. Figure IX.A.8 shows that the number of violations of the standard was significantly less (0 vs. 10-22) and Figure IX.A.9 shows there was also a significant difference in the average concentration of the ten highest measured values (89 $\mu g/m^3$ vs. 200^+ $\mu g/m^3$).

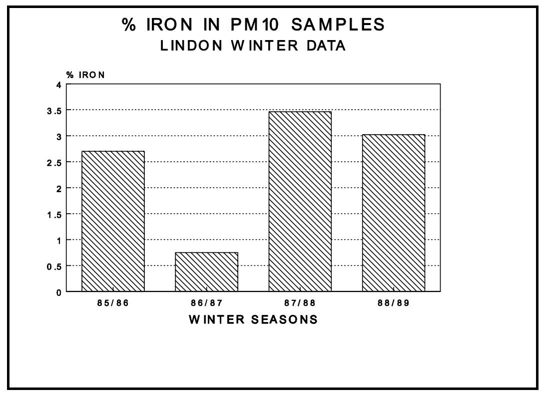
A possible explanation for this difference is that Geneva Steel was closed from August of 1986 through September of 1987. Further analysis of the past four winter seasons shows some interesting comparisons. The average of the ten highest concentrations measured during the winter of 1985-86, when Geneva was operating, was 231 $\mu g/m^3$. The following winter, 1986-87, when Geneva was closed, the average was 89 $\mu g/m^3$ which represented a decrease of 61%. The averages of the ten highest concentrations for the winters of 1987-88 and 1988-89, when Geneva was back in operation, were 192 $\mu g/m^3$ and 220 $\mu g/m^3$, respectively. This means that within two years of the reopening of Geneva, ambient PM_{10} concentrations had returned to 95% of what they were before the plant closed.



As expected, some of the emissions from a steel mill contain iron. Iron can be used as an indication of a steel mill's impact at a monitoring site. Chemical analysis has been performed on a number of filters from the Lindon monitor. The filters were selected for analysis based on whether they were among the highest values measured and whether filters from other monitoring stations were available to help characterize the polluted air mass. Iron is one of the elements for which the filters were analyzed.



As shown in Figures IX.A.10 and IX.A.11, the average iron concentration from the chemical analysis of filters representing the highest concentrations observed during the winter of 1985-86 is 6.64 $\mu g/m^3$ and the average percent concentration of iron in the samples is 2.7.



The average of 11 filters analyzed for the winter of 1986-87 is 0.64 $\mu g/m^3$ and the average percent iron in the samples is 0.75%. This information indicates that there was a 90% decrease in the iron concentrations and a 72% decrease in the percent concentration of iron in the samples during the period when Geneva was closed.

Since Geneva has resumed operation, the average concentration of iron for the filters which have been analyzed for the winter of 1987-88 is 6.11 $\mu g/m^3$ and the average percent concentration of iron in the samples is 3.46. For the winter of 1988-89, the average iron concentration is 4.88 $\mu g/m^3$ and the average percent concentration of iron is 3.02. This is a difference of 90% and 87% respectively in iron concentrations and a difference of 78% and 75% in the percent iron in the samples.

In making this analysis, other data has been reviewed to assure that all other conditions remained approximately the same during the period of observation. A review of the meteorological data suggests that the winter of 1986-87 was slightly warmer than normal, which implies that the use of residential solid fuel burners may have been reduced, which would result in a slight overstatement of the contribution of the mill to the ambient concentrations of PM_{10}. Even in view of the warmer winter, this up-down-up review strongly suggests that the impact of the Geneva steel mill at the Lindon monitoring station is greater than 50%. This review also suggests that conditions have not improved over the past two winter seasons. A weakness of this approach is that it is unable to provide information about other sources of PM_{10} in Utah County and the impact that they may have on the Lindon monitor. However, the closure of the steel mill provided the State with an opportunity to determine the relative impact of a major industrial source on ambient PM_{10} concentrations.

CMB APPORTIONMENT

Apportionment of PM_{10} impacts to individual major contributing sources was performed with the Chemical Mass Balance (CMB) receptor model. Two independent receptor modeling techniques were used to gain the most confidence in source apportionment contribution estimates.

The first technique was developed from the data collected when Geneva Steel was not operating. The period when Geneva Steel did not operate provided very valuable data on the chemical make-up of the ambient air without steel plant contamination. When Geneva Steel operated, there is a noticeable difference in the filter chemical "make-up". By methods of subtracting out the influence of the background chemical profiles, a composite Geneva steel profile was developed. The CMB model was performed on this Geneva composite profile and was used as the preliminary technique to apportion Geneva Steel.

The second technique to apportion PM_{10} was to use specific Geneva Steel source profiles collected by NEA, Inc., prior to June, 1989. Geneva Steel hired NEA to collect specific process profiles at Geneva, and to perform source apportionment using this data. The Bureau also performed CMB modeling using these source profiles as a corroborative technique to the first "up/down" CMB modeling method.

Comparisons using the first and second techniques for the winter of 1987/88 shows that the source contribution estimates from Geneva were in close agreement (56% by the up/down method and 50% by using NEA profiles). The up/down technique had about 6% more apportioned to Geneva Steel, because of the differences between the winter when Geneva Steel was not operating (warmer) and when Geneva Steel was operating (colder). The up/down technique is considered to be a level I analysis, which is the easiest and requires the least data. The second technique, using specific Geneva Steel source profiles, is considered a level II analysis. The level II analysis is preferred over a level I analysis. Only the level II analysis was performed for the winter of 1988/89, so no comparisons are available using the up/down technique with the source apportionment contained in this SIP.

A third technique, the development of a micro-inventory, was used to corroborate the first and second techniques and the level II analysis. The micro-inventory shows agreement with the previous techniques, and is contained in the technical support document.

As previously discussed, a dispersion modeling analysis was performed by the Bureau to help reconcile the CMB modeling results with actual emissions and meteorology. A technique was developed by the Bureau to allow for accurate model predictions in light winds. This technique employed use of meteorological data which was more accurate than data available from the National Weather Service. This technique showed very good agreement between model predictions, CMB source contributions and measured ambient PM_{10} concentrations. After long discussions with EPA on this technique, it was finally disapproved by EPA for use in the PM_{10} SIP and, therefore, could not be used in this analysis.

INVENTORY

Table IX.A.3 on the following two pages contains a base year and 2003 attainment inventory for Utah County. To obtain the vehicular emissions, MOBILE6 was run in order to obtain a fleet emission factor for both the base year of 1989, and for future years as the fleet turns over with newer "low NO_x" vehicles replacing older "high NO_x" vehicles. NO_x control applied to the control strategy reflects the percentage of decrease in the emission factor relative to the base year factor of 1989 as well as any concurrent changes in vmt or vehicle speed. A detailed mobile source emissions inventory is contained in Supplement II-02 to the Technical Support Document for this PM_{10} SIP. The calculations to establish these inventories are contained in Supplement II-02 of the Technical Support Document.

TABLE IX.A.3 (page 1 of 2)

UTAH STATE DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
PM10 SIP
Control Strategy Worksheet

Site:	**Utah County**	**Note: Any name changes to industrial sources since 1989 are reflected here**
Period:	Highest Days 1988/89	**on this page, but not in the baseline (Winter 88/89) inventory on the previous page**
Date:	6/18/2002	
Projection:	2003	**Inventory Data to Demonstrate Control**

	Post - SIP Allowable Inventory In Tons per Day				**Baseline Inventory for 1989 In Tons per Day**			
	PM10	**SO2**	**NOx**	**Total**	**PM10**	**SO2**	**NOx**	**Total**
BYU	0.0434	0.0019	1.0386	1.0840	0.3600	1.7500	1.0500	3.1600
Fifteen Fifty Associates	0.0345	0.0071	0.0671	0.1088	0.0400	0.0090	0.0820	0.1310
Utah Refractories	0.1564	0.0778	0.3689	0.6030	0.3578	0.2503	0.6350	1.2431
Geneva Rock	0.6035	0.5181	0.7365	1.8581	0.0250	0.0101	0.0965	0.1316
Heckett	0.3733	0.0162	0.1679	0.5574	0.5128	0.0178	0.1811	0.7117
Geneva Nitrogen (LaRoche	0.3154	0.0000	0.6475	0.9629	0.2800	0.0000	3.2080	3.4880
Lehi Cogen	0.0053	0.0176	0.8123	0.8352	0.0000	0.0000	0.0000	0.0000
Pacific States Cast Iron Pip	0.1582	0.0604	0.2953	0.5139	0.0850	0.0452	0.1299	0.2601
Provo City Power	0.0837	0.0182	2.4480	2.5499	0.0093	0.0025	0.2540	0.2658
Reilly Industries	0.0333	0.6300	0.3360	0.9993	0.0016	0.0001	0.0202	0.0219
Springville City Power	0.0209	0.0497	1.6875	1.7581	0.0009	0.0023	0.1720	0.1752
Pacificorp, Hale	0.0326	0.0038	2.1570	2.1934	0.0000	0.0000	0.0000	0.0000
Westroc, Highland	0.1757	0.0080	0.0844	0.2681	0.0000	0.0000	0.0000	0.0000
Westroc, Pleasent Grove	0.0564	0.0134	0.1321	0.2019	0.0138	0.0022	0.0227	0.0387
Geneva Other	1.1507			1.1507	0.8655	0.0000	0.0000	0.8655
Subtotal:	3.2432	1.4225	10.9790	15.6447	2.5517	2.0895	5.8514	10.4926
Geneva Steel Processes:								
Coke Gas Combustion	1.3463	1.2463		2.5926	2.0107	21.5973	0.0000	23.6079
Open Hearth (Q-BOP)	0.5627			0.5627	0.6932	0.0000	0.0000	0.6932
Blast Furnace	1.4616			1.4616	0.9447	0.0000	0.0000	0.9447
Sinter Plant	0.2767			0.2767	0.3781	0.0000	0.0000	0.3781
Secondary Sulfate		2.7244		2.7244	0.0000	3.1616	0.0000	3.1616
Secondary Nitrate			11.6005	11.6005	0.0000	0.0000	12.5945	12.5945
Geneva Subtotal:	3.6473	3.9707	11.6005	19.2186	4.0266	24.7589	12.5945	41.3800
				20.3693				42.2455
Area Sources:								
Wood Burning	3.87	0.06	0.32	4.25	2.70	0.04	0.22	2.96
Coal Burning	0.07	0.10	0.10	0.27	0.05	0.07	0.07	0.19
Natural Gas	0.34	0.02	4.31	4.67	0.24	0.02	3.00	3.26
Oil, LPG, and Other	0.02	0.26	0.12	0.40	0.02	0.18	0.08	0.28
planes, trains, & off-rd.	0.08	0.08	1.07	1.23	0.06	0.08	1.13	1.27
Subtotal:	4.38	0.52	5.92	10.82	3.07	0.39	4.50	7.96
Mobile Sources:								
Tailpipe PM10	0.34			0.34	0.40			0.40
Tire Wear	0.08			0.08	0.04			0.04
Re-entrained Road Dust	6.15			6.15	3.27			3.27
SO2		0.93		0.93		0.81		0.81
NOx			20.35	20.35			19.88	19.88
Subtotal:	6.57	0.93	20.35	27.85	3.71	0.81	19.88	24.40

Table IX.A.3 (Page 2 of 2)

IX.A.3.d. Monitoring Site Source Apportionment and Attainment Demonstration

Lindon

FIGURE IX.A.12

Source Apportionment

Figure IX.A.12 graphically demonstrates the source apportionment data contained on Table IX.A.4 on the following page and shows the contribution which the summarized components made to the overall concentration of PM_{10} at the Lindon monitoring site on February 18, 1989, which is the design day for the Lindon site.

Attainment Demonstration

Tables IX.A.4 and IX.A.5a and b show how the control strategies will reduce the PM_{10} concentrations at the Lindon site to no greater than 142.9 $\mu g/m^3$ in 2002 and 2003. MOBILE6 projections using projected new motor vehicle control program NO_x emission factors indicate there will be ample reduction from the new program to maintain ambient levels below the standard. Table IX.A.5.a demonstrates that the control strategies are effective in keeping the projected concentrations below 150 $\mu g/m^3$ for the design day, and Table IX.A.5.b demonstrates that the control strategies are effective in keeping the projected concentrations below 150 $\mu g/m^3$ for every episode day that was used in the analysis. This is the attainment demonstration for the Lindon site.

Table IX.A.4

Lindon Monitoring Site
Demonstration of Attainment
Design Day / All Years
micrograms/cubic meter

Table IX.A.5.a

LINDON MONITORING SITE
DEMONSTRATION OF ATTAINMENT
ALL DAYS / ALL YEARS
micrograms / cubic meter

Day	2-Dec-88	3-Dec-88	4-Dec-88	5-Dec-88	6-Dec-88	18-Dec-88	3-Jan-89
Year							
2002	98.5	117.4	135.4	104.5	86.5	95.2	105.4
2003	98.9	117.4	135.2	104.2	86.1	95.0	106.1
Conformity Only							
2010	98.8	113.3	127.8	99.1	81.3	90.2	108.1
2020	105.0	112.9	124.1	94.9	78.2	87.9	118.1

Day	17-Jan-89	18-Jan-89	19-Jan-89	20-Jan-89	21-Jan-89	27-Jan-89	28-Jan-89	29-Jan-89
Year								
2002	102.9	128.6	128.7	143.5	112.8	133.8	124.4	124.0
2003	103.5	129.2	128.8	142.9	112.3	134.5	124.2	123.7
Conformity Only								
2010	104.3	129.6	124.2	132.6	104.1	135.0	116.9	116.0
2020	112.0	138.4	124.2	123.3	96.8	145.1	113.6	111.9

Day	30-Jan-89	15-Feb-89	16-Feb-89	17-Feb-89	18-Feb-89	27-Dec-89	28-Dec-89
Year							
2002	130.2	90.4	92.7	133.6	138.9	99.8	125.6
2003	130.4	91.1	93.1	133.3	138.4	100.2	126.1
Conformity Only							
2010	127.4	93.6	93.4	125.7	128.5	99.8	125.6
2020	130.8	103.2	99.3	120.8	121.1	105.8	134.3

Table IX.A.5.b

WEST OREM

FIGURE IX.A.13

Source Apportionment

Figure IX.A.13 graphically demonstrates the source apportionment data detailed in Table IX.A.6 on the following page and shows the contribution which the summarized components made to the overall concentration of PM_{10} at the West Orem site.

Attainment Demonstration

Tables IX.A.6 and IX.A.7a and b show how the control strategies will reduce the PM_{10} concentrations at the West Orem monitoring station to no greater than 146.5 $\mu g/m^3$ in 2002 and 2003. MOBILE6 projections using projected new motor vehicle control program NO_x emission factors indicate there will be ample reduction from the new program to maintain ambient levels below the standard. Table IX.A.7.a demonstrates that the control strategies are effective in keeping the projected concentrations below 150 $\mu g/m^3$ for the design day, and Table IX.A.7.b demonstrates that the control strategies are effective in keeping the projected concentrations below 150 $\mu g/m^3$ for every episode day that was used in the analysis. This is the attainment demonstration for the West Orem monitoring site.

TABLE IX.A.6

West Orem Monitoring Site
Demonstration of Attainment
Design Day / All Years
micrograms/cubic meter

Table IX.A.7.a

WEST OREM MONITORING SITE
DEMONSTRATION OF ATTAINMENT
ALL DAYS / ALL YEARS
micrograms/cubic meter

Table IX.A.7.b

NORTH PROVO

FIGURE IX.A.14

Source Apportionment

Figure IX.A.14 graphically demonstrates the source apportionment data detailed in Table IX.A.8 on the following page and shows the contribution which the summarized components made to the overall concentrations of PM_{10} at the North Provo monitoring site.

Attainment Demonstration

Tables IX.A.8 and IX.A.9a and b show how the control strategies will reduce the PM_{10} concentrations at the North Provo monitoring station to no greater than 135.1 $\mu g/m^3$ in 2002 and 2003. Table IX.A.9.a demonstrates that the control strategies are effective in keeping the projected concentrations below 150 $\mu g/m^3$ for the design day, and Table IX.A.9.b demonstrates that the control strategies are effective in keeping the projected concentrations below 150 $\mu g/m^3$ for every episode day that was used in the analysis. This is the attainment demonstration for the North Provo monitoring site.

Table IX.A.8

North Provo Monitoring Station

Demonstration of Attainment

Design Day / All Years

micrograms/cubic meter

Table IX.A.9.a

North Provo Monitoring Site
Demonstration of Attainment
All Days / All Years
micrograms / cubic meter

Table IX.A.9.b

IX.A.4 SALT LAKE COUNTY - MAGNA

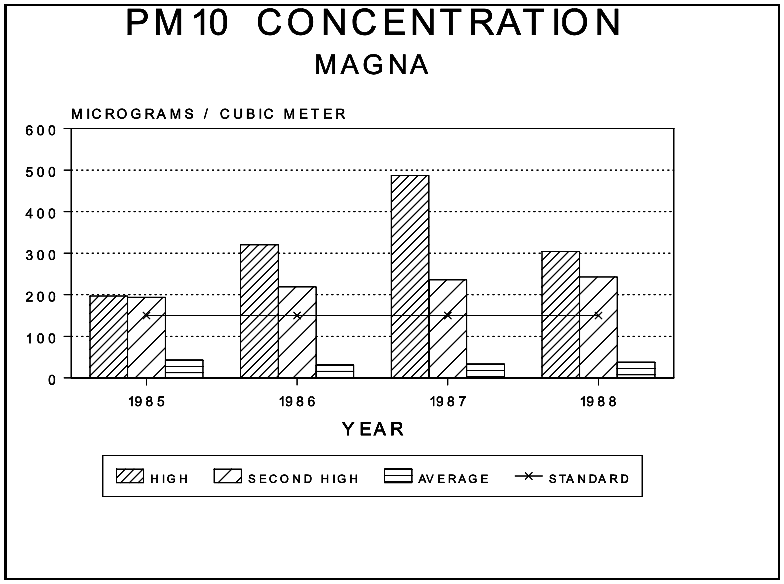


Figure IX.A.15 shows the ambient PM_{10} concentrations measured at the Magna monitoring station since 1985.

IX.A.4.a. Design Value Determination

Based on the 724 observations in the three year period from 1987 through 1989, the look-up table contained in Table IX.A.2, the data in Table IX.A.10 below indicates that the design value for Magna in Salt Lake County is the third-high reading, or 304 micrograms/meter^3 (µg/m^3) as measured on March 27, 1988.

MAGNA PM_{10} MONITORING DATA

	1989	1988	1987	1986	1985
High 24 Hr. Avg.	107	304	487	320	197
Second High 24 Hr.	105	243	236	219	194
Third High 24 Hr.	103	131	104	179	170
Fourth HIgh 24 Hr.	97	128	99	140	140
Number of days data	78	330	316	314	101

Table IX.A.10

IX.A.4.b. Source Apportionment

The violations of the PM_{10} standard in Magna were caused primarily by the blowing of tailings from the Kennecott tailings pond under certain meteorological conditions while the plant was shut down. This is confirmed by the meteorological data which is summarized in Table IX.A.11 below.

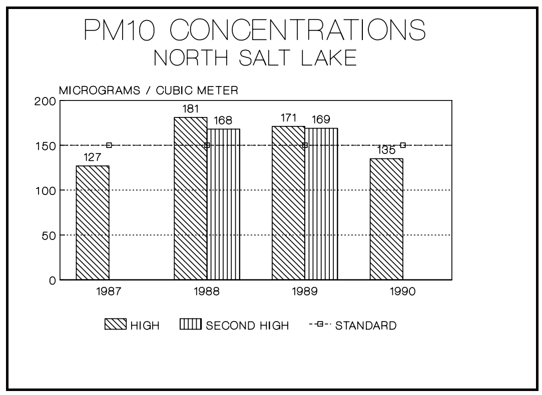
DATE	MEASURED CONCENTRATION	MAXIMUM WIND SPEED (MPH)	WIND DIRECTION (DEGREES)
6-24-85	170	15	308
7-30-85	197	18/11	150/309 WIND SHIFT
8-08-85	194	15/11	
	186/342 WIND SHIFT		
5-21-86	179	23	322
7-04-86	320	19	333
7-16-86	219	21/18	150/347 WIND SHIFT
4-18-87	236	25	304
6-22-87	487	21	324
3-27-88	304	20	359
4-07-88	243	23	295

TABLE IX.A.11

IX.A.5 SALT LAKE NONATTAINMENT AREA

IX.A.5.a. Ambient Data

Because the exceedances of the PM_{10} standard only occur during winter inversion periods in Salt Lake and Davis Counties, except in those areas which are impacted by blowing tailings from the Kennecott tailings pond (i.e., Magna), it is appropriate to look at winter seasons to determine the controls which may be necessary to reduce ambient PM_{10} concentrations to levels which are below the standard of 150 $\mu g/m^3$.



NORTH SALT LAKE

Figure IX.A.16 shows the ambient PM_{10} concentrations measured at the North Salt Lake monitoring station. As shown, the PM_{10} standard is exceeded in North Salt Lake. These data will be used in the determination of the North Salt Lake design value.

AIR MONITORING CENTER (AMC)

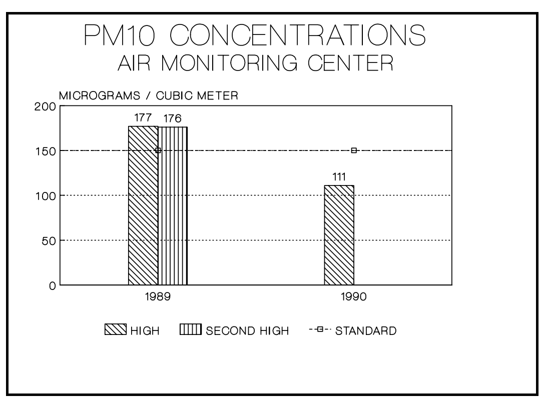
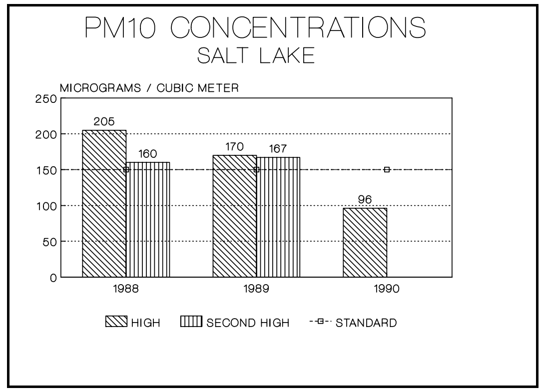


Figure IX.A.17 shows the ambient PM_{10} concentrations which were measured at the Air Monitoring Center in Salt Lake. As can be seen, the standard for PM_{10} is exceeded in Salt Lake City at the AMC. These data will be used in the determination of the design value for the AMC monitoring site.

SALT LAKE

Figure IX.A.18 shows the ambient PM_{10} concentrations which are measured at the Salt Lake monitoring site. As can be seen, the standard for PM_{10} is exceeded in Salt Lake at the Salt Lake Monitoring Site. These data will be used to determine the design value for the Salt Lake monitoring site.

IX.A.5.b. Design Value Determination



The design value is the PM_{10} concentration that becomes the reference point from which emissions of PM_{10} must be reduced in order to demonstrate attainment of the NAAQS at each monitoring site where violations of the NAAQS occur. As shown above, the Bureau of Air Quality is required to develop an independent design value for each of the monitoring sites in the Salt Lake nonattainment Area where exceedances of the NAAQS have been observed (i.e., the North Salt Lake, the Salt Lake, and the AMC monitoring sites).

EPA's concerns with the performance of dispersion modeling in Salt Lake County made it necessary to use actual measured PM_{10} concentrations to determine the design values. EPA's guidance on determining a design value using measured concentrations requires that the data record used in developing the design value should be a period when point source and area source emission rates are relatively constant and indicative of the usual condition. The design values for the Salt Lake - Davis County nonattainment Area monitoring sites were determined by using the table lookup method. Table IX.A.12 lists the design values for each monitoring site in the Salt Lake - Davis County nonattainment Area. Using Table IX.A.2, the design value for the AMC and the Salt Lake monitoring sites were the highest observerd value. There were more than 900 observations at the North Salt Lake monitoring site which allowed the use of the third highest observed concentration as the design value.

SITE	DESIGN VALUE
AIR MONITORING CENTER	177 µg/m^3
NORTH SALT LAKE	169 µg/m^3
SALT LAKE	170 Fg/m^3

TABLE IX.A.12

EPA requires that the highest design value in a PM_{10} nonattainment area be used in determining the amount of reduction that is necessary to attain the standard, and that the plan demonstrate attainment at all monitoring sites on all days on which the NAAQS was exceeded but for which the observed concentration was less than the design value for that site. Since the 177 µg/m^3 at the Air Monitoring Center is 27 µg/m^3 above the standard, an 15% reduction of PM_{10} emissions is necessary in the nonattainment area (i.e., [27/177] x 100) to attain the standard. Knowing the amount of reduction that isneeded is essential in determining the control strategies that must be implemented to achieve that reduction.

IX.A.5.c. Source Apportionment Methodology:

The problem of identifying which sources contribute to the PM_{10} violations measured along the Wasatch Front is a complicated one. The problems stem from the fact that a majority of what makes up the particulate measured on the filter is a result of chemical reactions which occur in the atmosphere. These pollutants which undergo chemical reactions are a result of gaseous emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x). The gaseous emissions, called precursors, are being controlled as part of the strategy to reduce the excessive particulate measured in Salt Lake and Davis Counties. The problem is compounded by the presence of a large source of secondary PM_{10} emissions, Kennecott, more than 23 miles away on the other side of the valley from the monitors. Kennecott performed a tracer study in February, 1990 to determine if its emissions impact the monitoring sites. That study showed that tall stack and low level emissions do, indeed, impact the monitoring sites. Chemical Mass Balance (CMB) modeling indicates that primary PM_{10} emissions from the smelter contribute as much as 12 Fg/m^3 at the Air Monitoring Center (on the 2nd high day). With the presence of primary emissions from the smelter, one can expect secondary PM_{10} to impact the monitor also, since the two components undergo similar transport and diffusion. It is assumed in the proposed control strategies adopted with this SIP that emissions from the tall stack impact the group I area.

The procedure of identifying contributing sources, called source apportionment, uses the EPA's latest recommended procedures. These procedures involve the use of two independent techniques for identifying the sources. By having agreement between the two techniques, a more confident source apportionment can be obtained.

The two techniques used involve the use of a receptor model, called the (CMB) model, and a micro-scale emissions inventory. The CMB model uses the chemical makeup of the measured particulate to trace back where the particulate came from. By knowing what the chemical makeup of each potential source is, this method can calculate what percent each source contributes to the particulate problem. The microinventory approach uses the amount of pollutant released by the sources to provide overall source category percent contributions.

Results from the CMB model are the main basis for source apportionment in this SIP. Source contribution estimates from the CMB model for vehicles, woodburning, and industry are compared to similar estimates using the micro-inventory approach. Inconsistencies in the source contributions must be reconciled before the source apportionment is considered adequate. The CMB and micro-inventory approtionment analysis and comparison results are discussed in detail in the Technical Support Document. A summary of the Salt Lake / Davis County inventory is contained in Table IX.A.13 on the following five pages.

UTAH STATE DEPARTMENT OF HEALTH

Division of Environmental Health
Bureau of Air Quality
PM10 S.I.P
Winter of 88/89 Emissions Inventory - Salt Lake & Davis Counties

(1) Area source emissions (Tons/Month)

	PM_{10}	SO_2	NO_x	TOTAL	Annual-> Winter Month Conversion Factor	1988 ACTUAL (Tons/Year) PM_{10}	SO_2	NO_x	Total
A> Vehicular									
Unleaded	9.3	23.5	262.5	295.3					
Leaded	15.1	38.1	425.5	478.7					
Diesel	51.8	157.6	693.6	903.0					
Roaddust	826.2	0.0	0.0	826.2					
Roadsanding	26.1	0.0	0.0	26.1					
Roadsalt	135.6	0.0	0.0	135.6					
Brake wear	36.7	0.0	0.0	36.7					
Sub-Total	1100.9	219.2	1381.6	2701.7					
B> Other transportation									
Trains	7.4	14.3	93.1	114.8	0.0833	88.4	172.1	1117.1	1377.6
Airplanes	6.8	9.5	79.8	96.0	0.0833	81.4	113.7	957.5	1152.5
Sub-Total	14.2	23.8	172.9	210.8		169.9	285.8	2074.6	2530.2
C> Space Heating									
Wood Burning	334.6	4.5	31.2	370.3	0.18	1890.5	25.2	176.4	2092.1
Coal burning	12.3	46.2	6.0	64.5	0.18	69.5	261.1	33.6	364.2
Natural Gas	17.3	2.2	363.7	383.2	0.18	97.6	12.3	2054.9	2164.8
Res/Comm Oil & Others	4.6	120.0	45.7	170.3	0.18	25.7	677.9	258.3	961.9
Sub-Total	368.7	172.8	446.6	988.2		2083.3	976.5	2523.2	5583.0

(2) Major Source Inventory - Salt Lake and south Davis county

January 1989 monthly inventory (Tons/Month)

COMPANY NAME	PM_{10}	SO_2	NO_x	TOTAL
AMOCO	8.9	668.9	33.7	711.5
ASPHALT MATERIALS asphalt plant	0.0	0.0	0.0	0.0
ASPHALT MATERIALS crusher	0.0	0.0	0.0	0.0
BOUNTIFUL CITY POWER	0.0	0.1	1.9	2.0
CENTRAL VALLEY WATER	0.0	0.4	17.6	18.1
CHEVRON	15.2	200.0	98.2	313.4
CPC #2 HOBUSCH 9400 SO. 1100 EAST	0.1	0.0	0.2	0.3
CPC #3 2200 NO. BOUNTIFUL	0.1	0.0	0.2	0.3
CPC WALKER WASATCH BLVD.	0.0	0.0	0.0	0.0
"CPC WHITEHILL PIT, BOUNTIFUL"	1.1	0.0	0.4	1.5
CRYSEN	0.2	0.1	10.6	11.0
FLYING J	1.9	27.6	21.1	50.6
GENEVA ROCK 350 W. 3900 SO.	0.3	0.0	0.1	0.5
GENEVA ROCK PT. OF MT.	3.4	0.0	0.0	3.4
HARPER PIT #1	0.0	0.0	0.0	0.0
HARPER PIT #10	0.0	0.0	0.0	0.0
HARSHAW FILTROL	1.5	1.0	5.0	7.5
HERCULES	26.5	0.1	20.1	46.7
INTERSTATE BRICK	4.5	0.0	0.2	4.7

Table IX.A.13 (page 1 of 6)

(2) Major Source Inventory - Salt Lake and south Davis County (Cont'd)

Company Name	January 1989 monthly inventory (Tons/Month)			
	PM_{10}	SO_2	NO_x	TOTAL
KMC BARNEY'S	0.0	0.0	0.0	0.0
KMC BONN CRUSHER	19.9	0.0	0.0	19.9
KMC COPP CONC.	0.2	9.6	1.3	11.1
KMC MINE	275.6	52.0	337.3	664.9
KMC POWER PLANT	19.8	342.0	250.9	612.7
KMC REFINERY	0.9	0.5	3.0	4.4
KMC TALL STACK	42.9	5580.0	0.0	5622.9
KMC LOW LEVEL FUG.	69.1	1004.4	12.0	1085.5
LDS HOSPITAL	0.7	9.6	5.9	16.2
LDS WELFARE SQ.	1.0	0.2	0.2	1.3
LONE STAR	0.0	0.0	0.0	0.0
MONROC BECK ST.	5.0	0.0	0.0	5.0
MONROC COTTONWOOD	0.1	0.0	0.5	0.7
MORTON SALT	2.0	0.0	0.5	2.5
MOUNTAIN BELL	0.0	0.0	0.1	0.1
MOUNTAIN FUEL 100S 180W.	0.2	0.1	5.2	5.5
MOUNTIAN FUEL 100S. 1078 W.	0.1	0.0	2.6	2.8
MURRAY CITY POWER	0.0	0.0	0.5	0.5
OSTLER ROCKY MOUNTAIN	2.1	0.0	0.5	2.6
PARSONS KERNS	0.0	0.0	0.0	0.1
PARSONS WOODSCROSS	0.1	0.0	0.3	0.4
PHILLIPS	10.0	508.6	58.1	576.7
PIONEER SAND & GRAVEL	0.0	0.0	0.0	0.0
SALT LAKE CITY ASPHALT	0.0	0.0	0.0	0.0
SALT LAKE CO. ASPHALT	0.1	0.0	0.1	0.2
SALT LAKE VALLEY SAND & GRAVEL	0.0	0.0	0.0	0.0
SAVAGE ROCK 6200S. 3100EAST	0.0	0.0	0.2	0.2
STAKER BECK ST.	5.8	0.0	0.0	5.8
STAKER DRAPER	0.0	0.0	0.0	0.0
STAKER WEST PIT	0.0	0.0	0.0	0.0
U OF U	27.2	47.0	30.8	105.0
UNION PACIFIC RESOURCES	4.3	0.1	0.6	5.0
UP&L 40N. 100W.	0.1	0.0	2.4	2.5
UP&L GADSBY	0.0	0.0	0.0	0.0
UTAH METAL WORKS	0.6	0.0	0.0	0.7
VA HOSPITAL	0.0	0.0	0.8	0.9
W.W. & W.B. GARDNER	0.8	0.0	0.0	0.8
WOLF EXCAVATING	0.6	0.0	0.4	1.0
Sub-Total	553.2	8452.5	923.6	9929.3

(3) Totals for all catagories

	PM_{10}	SO_2	NO_x	Total	Percent Breakout PM_{10}	SO_2	NO_x	Total
A> Vehicular	1100.9	219.2	1381.6	2701.7	54.0	2.5	47.2	19.5
B> Other transportation	14.2	23.8	172.9	210.8	0.7	0.3	5.9	1.5
C> Space Heating	368.7	172.8	446.6	988.2	18.1	1.9	15.3	7.1
D> Point sources	553.2	8452.5	923.6	9929.3	27.2	95.3	31.6	71.9
Grand Totals	2036.9	8868.3	2924.7	13830.0	100.0	100.0	100.0	100.0

Table IX.A.13 (page 2 of 6)

(4) Composite automobile profile breakout:

Fuel Type	Conditions	% in profile
Leaded	Cold Start	5.5
Leaded	Hot, normal	25.3
Unleaded	Cold start	3.4
Unleaded	Hot, normal	15.6
Diesel	Cold start	9.0
Diesel	Hot, normal	41.2
Total		100.0

(5) expected reductions in vehicular NO_x:

Mobile 4 was run in order to obtain a fleet emission factor for both the base year of 1988, and for future years as the fleet turns over with newer "low NO_x" vehicles replacing older "high NO_x" vehicles. The following is a listing of the emission fctors predicted by the model. NO_x control applied to the control strategy reflects the percentage of decrease in the emission factor relative to the base year factor of 1988. It should be noted that these emission factors reflect an average speed of 35 miles per hour.

1988	2.33 g/vmt	1994	1.623 g/vmt	2000	1.069 g/vmt
1989	2.19 g/vmt	1995	1.490 g/vmt	2001	0.990 g/vmt
1990	2.07 g/vmt	1996	1.38 g/vmt	2002	0.930 g/vmt
1991	1.93 g/vmt	1997	1.290 g/vmt	2003	0.900 g/vmt
1992	1.809 g/vmt	1998	1.285 g/vmt	2004	0.860 g/vmt
1993	1.72 g/vmt	1999	1.120 g/vmt	2005	0.854 g/vmt

Table IX.A.13 (page 3 of 6)

U T A H   S T A T E   D E P A R T M E N T   O F   H E A L T H

Bureau of Air Quality

Control Strategy Worksheet

Date: 26-AUG-92

INVENTORY DATA TO DEMONSTRATE CONTROL FOR 24 HOUR STANDARD:
POST-SIP   ALLOWABLE EMISSIONS

Tons Per Year

	PM-10	SOx	NOx	(Annual) TOTAL
AMOCO	113.0	2,357.0	638.0	3,108.0
ASPHALT MATERIALS asphalt plant	2.7	0.1	2.9	5.7
ASPHALT MATERIALS crusher	10.2	0.0	0.0	10.2
BOUNTIFUL CITY POWER	1.1	6.0	250.0	257.1
CENTRAL VALLEY WATER	0.7	4.0	205.6	210.2
CHEVRON	175.0	2,578.2	1,021.6	3,774.8
CPC #2 HOBUSCH 9400 SO. 1100 EAST	33.4	0.9	8.3	42.6
CPC #3 2200 NO. BOUNTIFUL	15.5	0.2	2.0	17.7
CPC WALKER WASATCH BLVD.	34.7	1.3	17.4	53.4
CPC WHITEHILL PIT ORCH DR. BOUNTIFUL	48.0	0.9	9.8	58.7
CRYSEN	2.7	206.0	156.0	364.7
FLYING J	22.0	864.6	278.7	1,165.3
GENEVA ROCK 350 W. 3900 SO.	4.5	0.5	5.3	10.3
GENEVA ROCK PT. OF MT.	81.0	9.6	21.4	112.0
HARPER PIT #1	7.8	1.9	18.4	28.1
HARPER PIT #10	16.3	1.6	17.9	35.8
HARSHAW FILTROL	34.9	31.5	94.5	160.9
HERCULES	318.1	1.5	240.9	560.5
INTERSTATE BRICK	95.9	0.0	46.5	142.4
KMC BARNEY'S	159.5	23.4	216.1	399.0
KMC BONN CONC.	234.1	0.0	0.0	234.1
KMC COPP CONC.	5.0	114.9	20.6	140.5
KMC MINE	2,801.0	78.0	4,048.1	6,927.1
KMC POWER PLANT	257.3	6,219.3	5,085.3	11,561.9
KMC REFINERY	51.9	162.6	121.0	335.5
KMC TALL STACK	876.0	14,191.2	0.0	15,067.2
KMC LOW LEVEL FUG.	464.0	4,383.8	145.0	4,992.8
LDS HOSPITAL	6.2	156.9	74.3	237.3
LDS WELFARE SQ.	11.2	0.5	1.4	13.0
LONE STAR	111.0	200.0	762.0	1,073.0
MONROC BECK ST.	69.5	8.0	17.2	94.7
* MONROC KEARNS	30.2	1.0	12.7	44.0
MORTON SALT	49.1	0.9	18.3	68.3
MOUNTAIN BELL	0.3	0.5	3.9	4.7
MOUNTAIN FUEL 100S 180W.	2.5	1.4	71.1	75.0
MOUNTIAN FUEL 100S. 1078 W.	1.1	0.4	31.2	32.7
MURRAY CITY POWER	1.6	2.4	250.0	254.0
OSTLER ROCKY MOUNTAIN	5.8	0.0	3.8	9.6
PARSONS KERNS	4.9	0.4	4.6	9.9
PARSONS WOODSCROSS	6.9	0.4	4.6	11.9
PHILLIPS	162.0	2,016.0	693.0	2,871.0
PIONEER SAND & GRAVEL	21.8	0.9	9.1	31.8
SALT LAKE CITY ASPHALT	5.3	0.1	5.7	11.1
SALT LAKE CO. ASPHALT	29.3	0.6	12.8	42.7
SALT LAKE VALLEY SAND & GRAVEL	43.9	13.9	21.4	79.2
SAVAGE ROCK 6200S. 3100EAST	28.5	1.2	14.1	43.8
STAKER BECK ST.	54.5	34.6	58.6	147.7

Table IX.A.13 (page 4 of 6)

STAKER DRAPER	13.4	1.1	16.5	31.0
STAKER WEST PIT	13.3	1.1	16.5	30.9
U OF U	74.3	219.3	245.8	539.4
UNION PACIFIC RESOURCES	27.5	1.9	20.5	49.9
UP&L 40N. 100W.	2.0	0.2	54.8	57.0
UP&L GADSBY	61.3	67.7	2,983.0	3,112.0
UTAH METAL WORKS	4.3	0.0	1.0	5.3
VA HOSPITAL	0.5	0.0	9.9	10.4
W.W. & W.B. GARDNER	24.1	6.2	13.0	43.2
WOLF EXCAVATING	3.3	0.3	3.4	7.0
TOTALS:	6,735.7	33,976.8	18,105.3	58,817.8

Table IX.A.13 (page 5 of 6)

UTAH STATE DEPARTMENT OF HEALTH
Division of Environmental Health
Bureau of Air Quality
PM10 S.I.P.
Control Strategy Worksheet

Date: 26-AUG-92

INVENTORIED EMISSIONS FROM 1988:	PM-10	SOx	NOx	TOTAL
FROM INDUSTRY:	5,619.4	95,702.1	10,967.6	112,289.1
FROM VEHICLES:	13,210.5	2,630.0	16,579.3	32,419.8
FROM SPACE HEATING:	2,083.3	976.5	2,523.2	5,583.0
FROM OTHERS:	169.9	285.8	2,074.6	2,530.2
TOTALS:	21,083.0	99,594.4	32,144.7	152,822.1

ITEMIZED PERCENTAGES OF REDUCTION:	PM-10	SOx	NOx	TOTAL
FROM INDUSTRY:	-19.87%	64.50%	-65.08%	47.62%
FROM VEHICLES:	-2.15%	43.19%	33.38%	19.70%
FROM SPACE HEATING:	48.70%	-17.79%	-17.79%	7.02%
FROM OTHERS:	0.00%	0.00%	0.00%	0.00%

PROJECTED ANNUAL EMISSIONS TOTALS:	PM-10	SOx	NOx	TOTAL
FROM INDUSTRY:	6,735.7	33,976.8	18,105.3	58,817.8
FROM VEHICLES:	13,494.7	1,494.0	11,045.7	26,034.3
FROM SPACE HEATING:	1,068.8	1,150.3	2,972.3	5,191.3
FROM OTHERS:	169.9	285.8	2,074.6	2,530.2
TOTALS:	21,469.0	36,906.9	34,197.8	92,573.6

OVERALL PERCENTAGE OF REDUCTION:

EQUALS ......((INVENTORIED 1988 TOTAL) - (PROJECTED ANNUAL TOTAL)) / (INVENTORIED 1988 TOTAL)

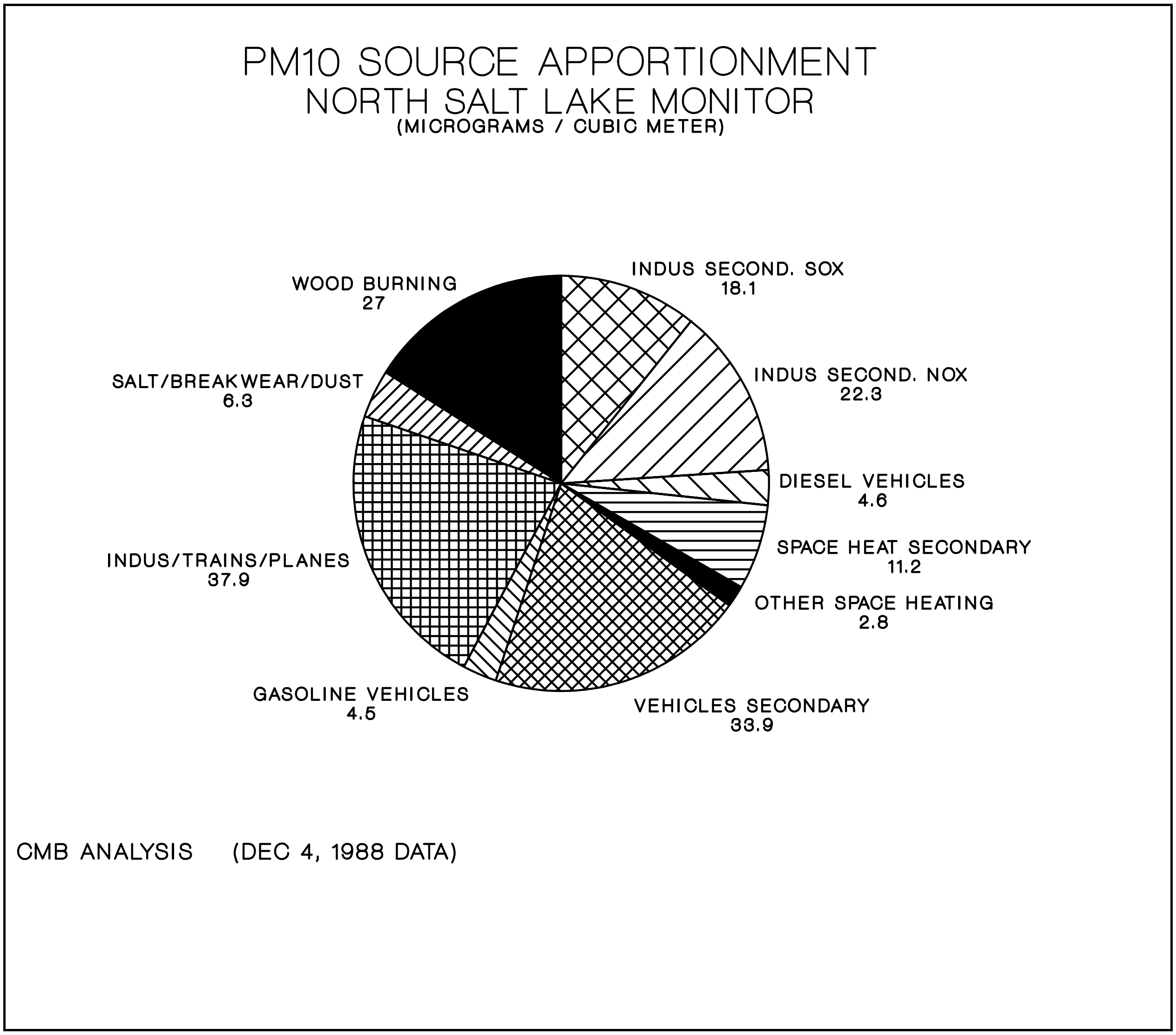
EQUALS ..... A 39.42% REDUCTION FROM 1988 LEVELS

APPLICATION TO ANNUAL DESIGN VALUE: 56.0 ug/m^3 * (100 - 39.42) / 100 = 33.92 ug/m^3

COMPARISON WITH ANNUAL NATIONAL AMBIENT AIR QUALITY STANDARD: 33.92 ug/m^3 IS LESS THAN 50.0 ug/m^3

Table IX.A.13 (page 6 of 6)

IX.A.5.d MONITORING SITE SOURCE APPORTIONMENT
NORTH SALT LAKE



Source Apportionment. Figure IX.A.19 graphically demonstrates the source apportionment data contained on Table IX.A.14 on the following page and shows the contribution which the summarized components made to the overall concentration of PM_{10} at the North Salt Lake monitoring site on December 4, 1988, which is the design day for the North Salt Lake monitoring site.

Attainment Demonstration. Tables IX.A.14, IX.A.15, and IX.A.16 show how the control strategies will reduce the PM_{10} concentrations at the North Salt Lake monitoring site to levels below the 150 Fg/m^3 standard through calendar year 2003. Mobile IV projections using new motor vehicle control program NO_x emission factors indicate that there will be ample reduction from the new program to maintain ambient levels below the standard for over ten years. This is the attainment demonstration for the North Salt Lake monitoring site.

UTAH STATE DEPARTMENT OF HEALTH
Division of Environmental Health
Bureau of Air Quality
PM10 S.I.P. Control Strategy Worksheet

Site: North Salt Lake Monitor — Date: 26-AUG-92
Period: EXCEEDANCE DAYS IN WINTERS 88/89,89/90 — Projection: 2001

Source Catagory	Design Day Attainment % Contribution	Impact	Additional Control	Additional Growth	Impact
(1) Major Point sources	42.92	72.3	16.3%	0.00%	60.5
Copper smelter	4.78	8.0	41.2%	0.00%	4.7
Oil refinery cat crackers	3.28	5.5	-15.8%	0.00%	6.4
Other point sources	10.90	18.4	36.4%	0.00%	11.7
Secondary Sulfate	10.73	18.1	60.0%	0.00%	7.2
Secondary Nitrate	13.23	22.3	-36.6%	0.00%	30.5
(2) Vehicle Sub-Total	29.28	49.3			41.2
Composite Mobile sources	5.45	9.2			
Leaded Gas Fueled	1.68	2.8	6.0%	55.80%	4.1
Diesel Fueled	2.74	4.6	23.8%	55.80%	5.5
Unleaded Gas Fueled	1.04	1.7	6.0%	55.80%	2.6
Re-entrained road dust	1.26	2.1	0.6%	0.00%	2.1
Road Salting	0.00	0.0	0.0%	0.00%	0.0
Brakewear	2.49	4.2	0.0%	55.80%	6.5
Secondary Sulfate	0.28	0.5	59.0%	55.80%	0.3
Secondary Nitrate	19.80	33.4	61.3%	55.80%	20.1
(3) Space Heating Sub-Total	24.28	40.9			29.4
Wood Burning	16.03	27.0	60.0%	25.02%	13.5
Coal Burning	0.59	1.0	60.0%	25.02%	0.5
Gas & Other Heating	1.05	1.8	0.0%	25.02%	2.2
Secondary Sulfate	0.22	0.4	17.6%	25.02%	0.4
Secondary Nitrate	6.40	10.8	5.0%	25.02%	12.8
(4) Other sources	3.52	5.9			5.9
Trains	0.53	0.9	0.0%	0.0%	0.9
Planes	0.48	0.8	0.0%	0.0%	0.8
Secondary Sulfate	0.03	0.1	0.0%	0.0%	0.1
Secondary Nitrate	2.48	4.2	0.0%	0.0%	4.2
Total	100.00	168.5			137.06

Design Value: 168.5 (Micrograms/Cubic Meter) — 04-DEC-88
139.31 = max concentration demonstration — 18-JAN-89

Note:
* % growth of VMT's each year = 3.0%
# % population growth per year = 1.5%
These figures were then projected out to the year: 2003

73.0% = expected % of diesel fuel burned that will meet new SO_2 standards
15,000 lb/hr = the worst case hourly emission rate from the tall stack

TABLE IX.A.14

NORTH SALT LAKE

Source Catagory	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
(1) Major Point sources	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5

Copper smelter	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Oil refinery cat crackers	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Other point sources	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Secondary Sulfate	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Secondary Nitrate	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5	30.5
(2) Vehicle Sub-Total	44.8	44.5	43.4	42.6	42.2	41.7	41.2	41.4	40.9	40.7	41.2
Composite Mobile sources											
Leaded Gas Fueled	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1
Diesel Fueled	4.1	4.2	4.3	4.5	4.6	4.7	4.9	5.0	5.2	5.3	5.5
Unleaded Gas Fueled	1.9	2.0	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.6
Re-entrained road dust	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Road Salting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brakewear	4.9	5.0	5.2	5.3	5.5	5.6	5.8	6.0	6.2	6.3	6.5
Secondary Sulfate	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Secondary Nitrate	28.6	27.8	26.3	25.1	24.1	23.2	22.2	21.8	20.8	20.2	20.1
(3) Space Heating Sub-T	25.3	25.7	26.1	26.5	26.9	27.3	27.7	28.1	28.5	29.0	29.4
Wood Burning	11.6	11.8	12.0	12.2	12.4	12.5	12.7	12.9	13.1	13.3	13.5
Coal Burning	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Gas & Other Heating	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2
Secondary Sulfate	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Secondary Nitrate	11.0	11.2	11.4	11.5	11.7	11.9	12.1	12.2	12.4	12.6	12.8
(4) Other sources	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Trains	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Planes	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Secondary Sulfate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Secondary Nitrate	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Total	136.58	136.62	135.92	135.58	135.49	135.45	135.36	135.91	135.84	136.14	137.06

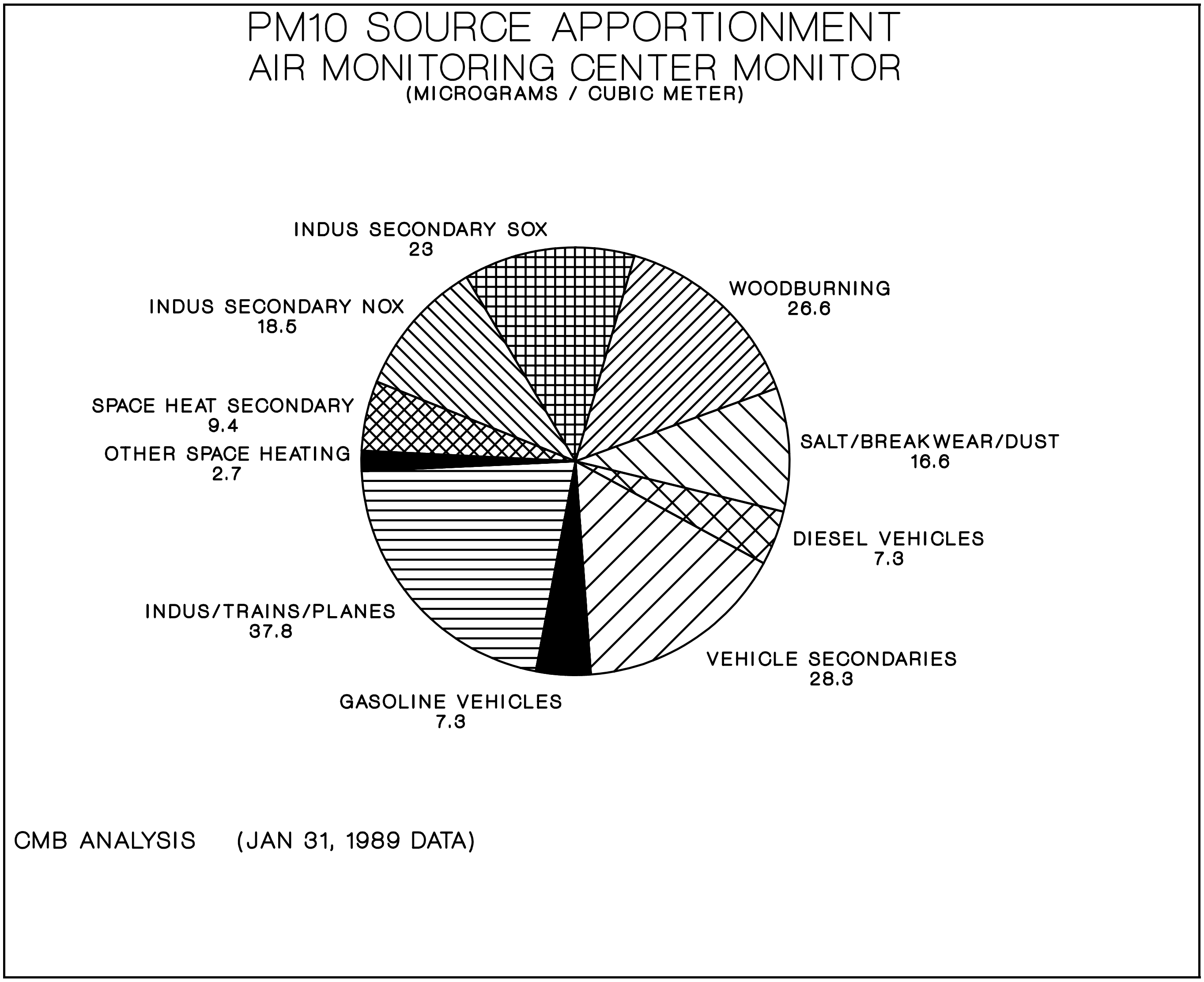
TABLE IX.A.15

NORTH SALT LAKE

The following table shows the attainment value (after applying the control strategy) for each day that CMB modeling was performed. These values are shown for the attainment demonstration in 1993, and for each year thereafter through 2003.

CMB DAY: YEAR	26-Jan-88	05-Feb-88	06-Feb-88	08-Feb-88	02-Dec-88	03-Dec88	04-Dec-88	18-Jan-89	27-Jan-89	30-Jan-89	17-Feb-89	05-Dec-89
1993	129.1	107.6	83.8	124.3	121.3	150.3	136.6	134.2	118.9	131.9	137.5	108.9
1994	129.4	107.8	84.1	124.6	121.6	150.4	136.6	134.7	119.0	132.2	137.7	109.4
1995	129.0	107.5	84.2	124.3	121.5	149.8	135.9	134.6	118.4	132.1	137.1	109.8
1996	129.0	107.5	84.4	124.3	121.6	149.5	135.6	134.8	118.2	132.2	136.9	110.4
1997	129.1	107.6	84.7	124.4	121.8	149.5	135.5	135.2	118.2	132.5	136.9	110.9
1998	129.3	107.7	85.1	124.7	122.1	149.5	135.5	135.7	118.2	132.8	137.0	111.6
1999	129.5	107.9	85.4	124.8	122.4	149.5	135.4	136.1	118.2	133.1	137.0	112.2
2000	130.1	108.4	85.9	125.5	123.1	150.2	135.9	137.0	118.7	133.8	137.6	113.0
2001	130.3	108.5	86.2	125.7	123.4	150.2	135.8	137.4	118.7	134.2	137.7	113.6
2002	130.8	108.8	86.7	126.2	124.0	150.6	136.1	138.1	119.0	134.8	138.1	114.4
2003	131.7	109.6	87.3	127.1	124.9	151.7	137.1	139.3	119.9	135.8	139.0	115.3

TABLE IX.A.16



AIR MONITORING CENTER

Source Apportionment. Figure IX.A.20 graphically demonstrates the source apportionment data contained on Table IX.A.17 on the following page and shows the contribution which the summarized components made to the overall concentration of PM_{10} at the Air Monitoring Center monitoring site on January 31, 1989, which is the design day for the Air Monitoring Center monitoring site.

Attainment Demonstration. Tables IX.A.17, IX.A.18, and IX.A.19 show how the control strategies will reduce the PM_{10} concentrations at the Air Monitoring Center monitoring site to levels below the 150 Fg/m^3 standard through calendar year 2000. Mobile IV projections using new motor vehicle control program NO_x emission factors indicate that there will be ample reduction from the new program to maintain ambient levels below the standard for over eight years. This is the attainment demonstration for the Air Monitoring Center monitoring site.

UTAH STATE DEPARTMENT OF HEALTH
Division of Environmental Health
Bureau of Air Quality
PM10 S.I.P Control Strategy Worksheet

Site: Air monitoring Center   Date: 26-AUG-92
Period: EXCEEDANCE DAYS IN WINTERS 88/89,89/90   Projection: 1999

Source Catagory	Design Day Attainment % Contribution	Impact	Additional Control	Additional Growth	Impact
(1) Major Point sources	41.17	73.0	18.6%	0.00%	59.5
Copper smelter	0.00	0.0	41.2%	0.00%	0.0
Oil refinery cat crackers	5.35	9.5	-15.8%	0.00%	11.0
Other point sources	12.42	22.0	36.4%	0.00%	14.0
Secondary Sulfate	12.97	23.0	60.0%	0.00%	9.2
Secondary Nitrate	10.42	18.5	-36.6%	0.00%	25.3
(2) Vehicle Sub-Total	33.47	59.4			53.6
Composite Mobile sources	8.18	14.5			
Leaded Gas Fueled	2.52	4.5	6.0%	38.42%	5.8
Diesel Fueled	4.10	7.3	23.8%	38.42%	7.7
Unleaded Gas Fueled	1.55	2.8	6.0%	38.42%	3.6
Re-entrained road dust	7.54	13.4	0.6%	0.00%	13.3
Road Salting	0.00	0.0	0.0%	0.00%	0.0
Brakewear	1.82	3.2	0.0%	38.42%	4.5
Secondary Sulfate	0.34	0.6	59.0%	38.42%	0.3
Secondary Nitrate	15.59	27.7	51.9%	38.42%	18.4
(3) Space Heating Sub-Total	21.86	38.8			26.2
Wood Burning	15.02	26.6	60.0%	17.79%	12.6
Coal Burning	0.55	1.0	60.0%	17.79%	0.5
Gas & Other Heating	0.98	1.7	0.0%	17.79%	2.0
Secondary Sulfate	0.27	0.5	0.0%	17.79%	0.6
Secondary Nitrate	5.04	8.9	0.0%	17.79%	10.5
(4) Other sources	3.51	6.2			6.2
Trains	0.79	1.4	0.0%	0.0%	1.4
Planes	0.73	1.3	0.0%	0.0%	1.3
Secondary Sulfate	0.04	0.1	0.0%	0.0%	0.1
Secondary Nitrate	1.95	3.5	0.0%	0.0%	3.5
Total	100.00	177.4			145.47

Design Value 177.4 (Micrograms/Cubic Meter) 31-Jan-89
149.24 = max concentration demonstration 18-Jan-89

Note:
* % growth of VMT's each year = 3.0%
# % population growth per year = 1.5%
These figures were then projected out to the year: 1999

73.0% = expected % of diesel fuel burned that will meet new SO_2 standards
15.000 lb/hr = the worst case hourly emission rate from the tall stack

TABLE IX.A.17

AIR MONITORING CENTER

Source Catagory	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
(1) Major Point sources	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5	59.5
Copper smelter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil refinery catcracker	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Other point sources	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Secondary Sulfate	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Secondary Nitrate	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3
(2) Vehicle Sub-Total	55.3	55.2	54.5	54.1	53.9	53.8	53.6	54.0	53.8	54.0	54.6
Composite Mobile sources											
Leaded Gas Fueled	4.9	5.0	5.2	5.3	5.5	5.6	5.8	6.0	6.2	6.4	6.5
Diesel Fueled	6.4	6.6	6.8	7.0	7.2	7.5	7.7	7.9	8.2	8.4	8.6
Unleaded Gas Fueled	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
Re-entrained road dust	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
Road Salting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brakewear	3.8	3.9	4.0	4.1	4.2	4.3	4.5	4.6	4.8	4.9	5.0
Secondary Sulfate	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Secondary Nitrate	23.7	23.0	21.8	20.8	20.0	19.2	18.4	18.1	17.3	16.7	16.7
(3) Space Heating Sub-T	23.9	24.3	24.6	25.0	25.4	25.8	26.2	26.5	26.9	27.3	27.8
Wood Burning	11.5	11.7	11.8	12.0	12.2	12.4	12.6	12.7	12.9	13.1	13.3
Coal Burning	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Gas & Other Heating	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2
Secondary Sulfate	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Secondary Nitrate	9.6	9.8	9.9	10.1	10.2	10.4	10.5	10.7	10.9	11.0	11.2
(4) Other sources	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Trains	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Planes	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Secondary Sulfate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Secondary Nitrate	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total	144.93	145.20	144.87	144.84	145.03	145.27	145.47	146.21	146.45	146.99	148.07

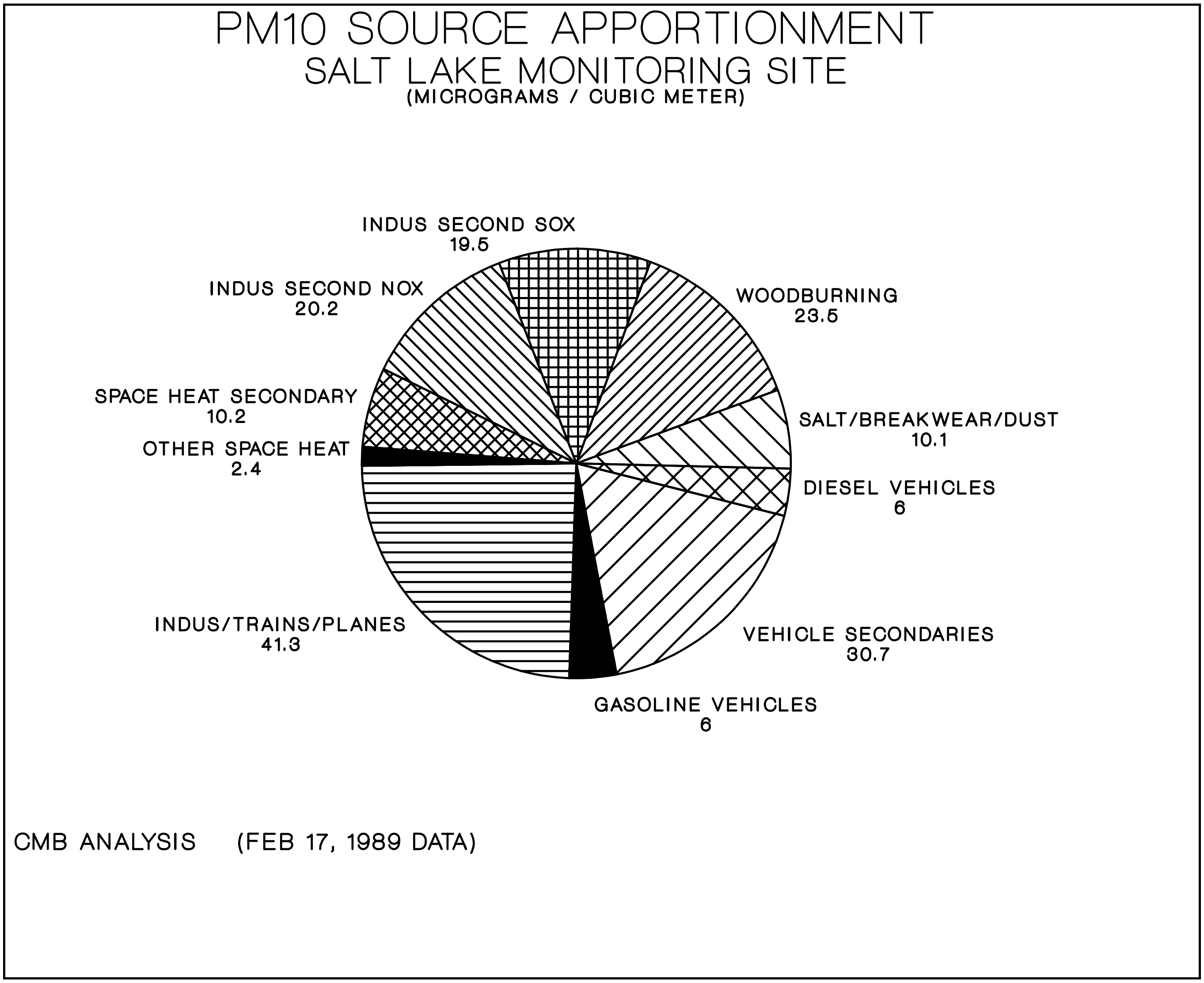
TABLE IX.A.18

AIR MONITORING CENTER

The following table shows the attainment value (after applying the control strategy) for each day that CMB modeling was performed. These values are shown for the attainment demonstration in 1993, and for each year thereafter through 2003.

CMB DAY: YEAR	1-18-89	1-19-89	1-20-89	1-30-89	1-31-89	2-17-89	2-18-89	11-21-89	12-02-89	12-03-89	12-04-89	12-06-89	12-27-89
1993	149.0	134.0	122.1	135.5	144.9	139.8	121.0	94.6	96.5	100.2	110.4	93.0	107.3
1994	149.3	134.4	122.5	135.7	145.2	140.0	121.1	95.0	96.7	100.4	110.8	93.6	107.5
1995	148.8	134.2	122.3	135.2	144.9	139.6	120.6	95.2	96.6	100.2	111.0	94.2	107.3
1996	148.7	134.3	122.4	135.0	144.8	139.6	120.4	95.5	96.7	100.2	111.2	94.8	107.3
1997	148.8	134.6	122.8	135.1	145.0	139.7	120.4	95.9	96.8	100.3	111.6	95.4	107.4
1998	149.1	135.0	123.1	135.2	145.3	139.9	120.4	96.2	97.0	100.4	112.0	96.1	107.6
1999	149.2	135.3	123.5	135.3	145.5	140.0	120.4	96.6	97.2	100.5	112.5	96.8	107.7
2000	150.1	136.1	124.3	136.0	146.2	140.7	121.1	97.2	97.7	101.0	113.1	97.6	108.1
2001	150.3	136.5	124.7	136.1	146.4	140.9	121.1	97.6	97.9	101.1	113.5	98.3	108.2
2002	150.9	137.2	125.4	136.6	147.0	141.3	121.5	98.1	98.3	101.4	114.1	99.1	108.6
2003	152.2	138.3	126.5	137.7	148.1	142.3	122.5	98.8	98.9	102.1	114.9	99.9	109.2

TABLE IX.A.19



SALT LAKE

Source Apportionment. Figure IX.A.21 graphically demonstrates the source apportionment data contained on Table IX.A.20 on the following page and shows the contribution which the summarized components made to the overall concentration of PM_{10} at the Salt Lake monitoring site on February 17, 1989, which is the design day for the Salt Lake monitoring site.

Attainment Demonstration. Tables IX.A.20, IX.A.21, and IX.A.22 show how the control strategies will reduce the PM_{10} concentrations at the Salt Lake monitoring site to levels below the 150 Fg/m^3 standard through calendar year 2003. Mobile IV projections using new motor vehicle control program NO_x emission factors indicate that there will be ample reduction from the new program to maintain ambient levels below the standard for over ten years. This is the attainment demonstration for the Salt Lake monitoring site.

UTAH STATE DEPARTMENT OF HEALTH
Division of Environmental Health
Bureau of Air Quality
PM10 S.I.P. Control Strategy Worksheet

Site: Salt Lake City Monitor — Date: 26-AUG-92
Period: EXCEEDANCE DAYS IN WINTERS 88/89,89/90 — Projection:2003

Source Catagory	Design Day Attainment % Contribution	Impact	Additional Control	Additional Growth	Impact
(1) Major Point sources	43.98	74.7	19.6%	0.00%	60.1
Copper smelter	5.69	9.7	41.2%	0.00%	5.7
Oil refinery cat crackers	3.23	5.5	-15.0%	0.00%	6.3
Other point sources	11.71	19.9	36.4%	0.00%	12.6
Secondary Sulfate	11.45	19.5	60.0%	0.00%	7.8
Secondary Nitrate	11.90	20.2	-36.6%	0.00%	27.6
(2) Vehicle Sub-Total	31.19	53.0			46.4
Composite Mobile sources	7.09	12.0			
Leaded Gas Fueled	2.18	3.7	6.0%	55.80%	5.4
Diesel Fueled	3.56	6.0	23.8%	55.80%	7.2
Unleaded Gas Fueled	1.35	2.3	6.0%	55.80%	3.4
Re-entrained road dust	4.21	7.1	0.6%	0.00%	7.1
Road Salting	0.00	0.0	0.0%	0.00%	0.0
Brakewear	1.80	3.0	0.0%	55.80%	4.8
Secondary Sulfate	0.30	0.5	59.0%	55.80%	0.3
Secondary Nitrate	17.80	30.2	61.3%	55.80%	18.2
(3) Space Heating Sub-Total	21.25	36.1			26.1
Wood Burning	13.85	23.5	60.0%	25.02%	11.8
Coal Burning	0.51	0.9	60.0%	25.02%	0.4
Gas & Other Heating	0.90	1.5	0.0%	25.02%	1.9
Secondary Sulfate	0.23	0.4	17.6%	25.02%	0.4
Secondary Nitrate	5.75	9.8	5.0%	25.02%	11.6
(4) Other sources	3.58	6.1			6.1
Trains	0.69	1.2	0.0%	0.0%	1.2
Planes	0.63	1.1	0.0%	0.0%	1.1
Secondary Sulfate	0.03	0.1	0.0%	0.0%	0.1
Secondary Nitrate	2.23	3.8	0.0%	0.0%	3.8
Total	100.00	169.9			138.69

Design Value 169.9 (Micrograms/Cubic Meter) 17-Feb-89
142.21 = max concentration demonstration

Note:
 * % growth of VMT's each year = 3.0%
 # % population growth per year = 1.5%
 These figures were then projected out to the year: 2003

73.0% = expected % of diesel fuel burned that will meet new SO_2 standards
15.000 lb/hr = the worst case hourly emission rate from the tall stack

TABLE IX.A.20

SALT LAKE CITY

Source Catagory	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
(1) Major Point sources	60.1	60.1	60.1	760.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1
Copper smelter	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Oil refinery cat crackers	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Other point sources	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6
Secondary Sulfate	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Secondary Nitrate	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6
(2) Vehicle Sub-Total	48.6	48.4	47.5	47.0	46.6	46.3	46.0	46.2	45.8	45.8	46.4
Composite Mobile sources											
Leaded Gas Fueled	4.0	4.2	4.3	4.4	4.6	4.7	4.8	5.0	5.1	5.3	5.4
Diesel Fueled	5.3	5.5	5.7	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2
Unleaded Gas Fueled	2.5	2.6	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4
Re-entrained road dust	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
Road Salting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brakewear	3.5	3.6	3.8	3.9	4.0	4.1	4.2	4.3	4.5	4.6	4.8
Secondary Sulfate	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Secondary Nitrate	25.9	25.2	23.8	22.7	21.9	21.0	20.1	19.8	18.9	18.3	18.2
(3) Space Heating Sub-Total	22.5	22.9	23.2	23.6	23.9	24.3	24.6	25.0	25.4	25.8	26.1
Wood Burning	10.1	10.3	10.4	10.6	10.8	10.9	11.1	11.3	11.4	11.6	11.8
Coal Burning	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Gas & Other Heating	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Secondary Sulfate	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Secondary Nitrate	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.3	11.4	11.6
(4) Other sources	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Trains	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Planes	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Secondary Sulfate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Secondary Nitrate	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Total	137.34	137.46	136.91	136.68	136.68	136.74	136.75	137.34	137.38	137.75	138.69

Table IX.A.21

SALT LAKE CITY

The following table shows the attainment value (after applying the control strategy) for each day thatB modeling was performed. These values are shown for the attainment demonstration in 1993, and for each year thereafter through 2003.

CMB DAY:	04-Jan-88	26-Jan-88	28-Jan-88	05-Feb-88	03-Dec-88	18-Jan-89	20-Jan-89	30-Jan-89	17-Feb-89
YEAR									

1993	90.1	121.3	84.7	108.5	126.8	139.1	113.6	116.8	137.3
1994	90.4	121.6	85.1	108.6	126.9	139.3	114.1	117.1	137.5
1995	90.4	121.5	85.3	108.3	126.4	139.0	114.3	117.0	136.9
1996	90.6	121.6	85.6	108.2	126.1	139.0	114.7	117.0	136.7
1997	90.8	121.8	86.0	108.3	126.1	139.2	115.2	117.3	136.7
1998	91.1	122.1	86.4	108.4	126.1	139.4	115.8	117.5	136.7
1999	91.3	122.3	86.8	108.5	126.1	139.6	116.3	117.8	136.8
2000	91.9	123.0	87.4	109.0	126.6	140.4	117.1	118.4	137.3
2001	92.2	123.2	87.8	109.1	126.6	140.6	117.7	118.7	137.4
2002	92.6	123.7	88.4	109.4	126.9	141.1	118.4	119.2	137.7
2003	93.3	124.6	89.1	110.2	127.8	142.2	119.4	120.2	138.7

Table IX.A.22

IX.A.6 CONTROL STRATEGIES

IX.A.6.a. The following control strategies were implemented to control PM_{10} emissions in the Magna portion of the Salt Lake nonattainment area:

After the issuance of a Notice of Violation and a series of negotiations between Kennecott and the Utah Air Conservation Committee, an agreement was signed whereby Kennecott agreed to:

(1) construct a series of dikes and sprinkler systems on the tailings pond which would allow the company to distribute water on the pond until the company began operation;

(2) replace the existing tailings distribution system to guarantee that the tailings pond would remain covered with wet tailings after the company began operation;

(3) apply controls to the periphery of the pond;

(4) develop and submit a plan to control emissions from the pond in the event of a temporary plant shutdown; and

(5) develop a plan to control emissions from the pond in the event of a permanent plant shutdown.

Following the restart of operations by Kennecott, the Executive Secretary of the Air Conservation Committee issued a compliance order dated October 4, 1989, to Kennecott which required Kennecott to replace and upgrade the peripheral discharge system for tailings flowing to the tailings pond and implement plans for dust control during current operation, temporary shutdown, and permanent shutdown of the mine and associated tailings pond. The peripheral discharge system completed July 1, 1988, allows Kennecott to keep the surface of the tailings pond wet and thereby reduce or eliminate blowing tailings. As summarized in Table IX.A.23, since the completion of the new system, similar meteorological conditions have not resulted in a violation of the NAAQS. The compliance order has corrected the problem of ambient PM_{10} violations caused by blowing Kennecott tailings in the Magna area.

DATE	MEASURED CONCENTRATION	MAXIMUM WIND SPEED (MPH)	WIND DIRECTION (DEGREES)
9-27-88	87	9	232
5-18-89	35	25	156
5-23-89	42	19	231
8-23-89	53	23	169
9-30-89	36	25	293

TABLE IX.A.23

IX.A.6.b. The following industrial control strategies will be implemented to control PM_{10} emissions in the Utah County nonattainment Area:

a) All industrial sources of PM_{10} in Utah County comprise 63.5% of the PM_{10} impact at the Lindon monitoring site, 68.2% at the West Orem monitoring site, and 50.5% at the North Provo monitoring site. New operating parameters and emissions limitations for PM_{10}, SO_2, and NO_x for the most significant existing stationary sources of primary and secondary PM_{10} impacting the ambient concentrations at the monitor site are detailed in Section IX, Part H of the Utah State Implementation Plan.

Table IX.A.24.a lists the annual emissions caps for the significant sources (i.e., those whose emissions exceed 100 tons/year of primary PM_{10}, 200 tons/year of NO_x or 250 tons/year of SO_2) except for Geneva Steel.

Summary of Tons/Year Emission Caps			
Company	**Primary PM_{10}**	**NO_x**	**SO_2**
Geneva Nitrogen, Inc.	86.	223.8	
Provo City Power		254	
Springville City Power		248	

TABLE IX.A.24.a

Due to shutting down or reducing operations at the coke plant, sinter plant, foundry and rolling mill scarfer facility, and fuel switching, Geneva Steel is in the process of banking a significant amount of their emissions. Table IX.A.24.b lists the allowable annual emissions limits at Geneva Steel before the emissions mentioned above are banked, Table IX.A.24.c lists the banked emissions from Geneva Steel used in the attainment demonstration for this revision of the PM_{10} SIP, and Table IX.A.24.d lists the annual emissions limits at Geneva after those emissions are banked (i.e., subtracting Table IX.A.24.c from Table IX.A.24.b results in Table IX.A.24.d).

Annual Emissions - Geneva Steel (Before Banking) - Tons/Year			
Geneva Steel Process	**PM_{10}**	**SO_2**	**NO_x**
Coke Plant	491.4	454.9	
Sinter Plant	101.0		
Blast Furnace	454.4		
Q-BOP	205.4		
Geneva Other	499.1		
Secondary Sulfate		994.4	
Secondary Nitrate			4234.2

TABLE IX.A.24.b

Banked Emissions - Geneva Steel (Tons/Year)			
Geneva Steel Process	**PM_{10}**	**SO_2**	**NO_x**
Coke Plant	461.8	454.9	557.2
Sinter Plant	101.0	434.2	705.2
Q-BOP	27.2		
Geneva Other	51.0		
Totals	641	889.1	1262.4

TABLE IX.A.24.c

Annual Emissions - Geneva Steel (After Banking) - Tons/Year			
Geneva Steel Process	**PM_{10}**	**SO_2**	**NO_x**
Coke Plant	29.6	0.0	(see footnote 1)
Sinter Plant	(see footnote 2)	(see footnote 2)	(see footnote 2)
Blast Furnace	454.4		
Q-BOP	178.2		
Geneva Other	448.1		
Secondary Sulfate		560.2	
Secondary Nitrate			2971.8

TABLE IX.A.24.d

Table IX.A.25.a lists the 24-hr emission limits for the significant sources (i.e., those whose emissions exceed 100 tons/year of primary PM_{10}, 200 tons/year of NO_x, or 250 tons/year of SO_2) except Geneva Steel.

Summary of Tons/Day Emission Limits			
Company	**Primary PM_{10}**	**NO_x**	**SO_2**
Geneva Nitrogen, Inc.	0.24	0.622	
Provo City Power		2.45	
Springville City Power		1.68	
Geneva Rock Products Asphalt Plant Baghouse Stack	0.103	0.568	0.484

TABLE IX.A.25.a

Table IX.A.25.b lists the allowable daily emissions at Geneva Steel for September through May after the banking mentioned above and Table IX.A.25.c lists the allowable daily emissions at Geneva Steel for June through August after the banking mentioned above.

Daily Emissions - Geneva Steel (September - May) - Tons/Day			
Geneva Steel Process	**PM_{10}**	**SO_2**	**NO_x**
Coke Plant	0.1	0.0	(see footnote 1)
Sinter Plant	(see footnote 2)	(see footnote 2)	(see footnote 2)
Blast Furnace	1.3		
Q-BOP	0.5		
Geneva Other	1.2		
Secondary Sulfate		1.0	
Secondary Nitrate			7.7

TABLE IX.A.25.b

Daily Emissions - Geneva Steel (June - August) - Tons/Day			
Geneva Steel Process	**PM_{10}**	**SO_2**	**NO_x**
Coke Plant	0.1	0.0	(see footnote 1)
Sinter Plant	(see footnote 2)	(see footnote 2)	(see footnote 2)
Blast Furnace	1.3		
Q-BOP	0.5		
Geneva Other	1.4		
Secondary Sulfate		3.4	
Secondary Nitrate			9.6

TABLE IX.A.25.c

Footnote 1: All NOx emissions from coke plant ovens have been banked. Emissions of NOx associated with continuing operations in the vicinity of the coke plant (coke pile handling) are accounted for in the secondary nitrate item.

Footnote 2: All emissions of PM10, SO2, and NOx from the sinter plant have been banked.

The methods used to establish both the 24-hour emission limits and annual caps are documented in Supplement II-02 of the Technical Support Document and relevant permits.

In Tables IX.A.24.b, c, and d and Tables IX.A.25.b and c, the "Geneva Other" category includes the power house, rolling mill, and fugitives. In Tables IX.A.25.b and c, the "Secondary Sulfate" category includes SO_2 emissions from the sinter plant, blast furnace, Q-BOP, and sources included in the “Geneva Other” category and the “Secondary Nitrate” category includes NO_x emissions from the coke plant, sinter plant, blast furnace, Q-BOP, and sources included in the “Geneva Other” category.

Notwithstanding any other provision in the Utah SIP, no change to this SIP revision shall be effective to change the federal enforceability of the emission limits or other requirements of the Utah County PM_{10} SIP revision without EPA approval of such change as a SIP revision.

IX.A.6.c. The following industrial control strategies will be implemented to control PM_{10} emissions in the Salt Lake nonattainment area:

(1) All industrial sources of PM_{10} located in or impacting the Salt Lake nonattainment area comprised 41.17% of the PM_{10} impact (primary and secondary) at the AMC monitoring site, 43.98% at the Salt Lake monitoring site, and 42.92% at the North Salt Lake monitoring site on the design day at each site which occurred during the winter period. RACT requirements were developed for all sources impacting the nonattainment area, as a minimum, and new operating parameters and emissions limitations for PM_{10}, SO_2, and NO_x for all existing sources of primary and secondary PM_{10} impacting the ambient concentrations at the monitor sites are detailed in Section IX, Part H of the SIP. It must be noted that, although the allowable emissions levels have been reduced significantly, the actual emissions levels have the potential to increase slightly, since some sources in the inventory were not operating or in existence during the winter of 1988/89, and the State is required to demonstrate attainment when all sources are operating at their permitted levels. This is documented in the Technical Support Document.

(2) Refinery Category. The refineries located in Salt Lake and Davis counties had emission limitations and annual emission estimates assigned in the PM_{10} SIP based on the following rationale:

(a) After reviewing several years worth of operational records provided by the five refineries for emission estimates/calculations and production levels, the State agreed with the refinery officials that there was significant variability from day to day and from year to year. Therefore, the refineries were allowed maximum never-to-be exceeded daily limits of PM_{10}, SO_2, NO_x based on the apparent variability. Emissions were capped at these maximum levels from the sources that could have their emissions determined by fuel metering/and calculations and from the other sources that would be stack tested every 1-3 years. The process flaring emissions and the emissions from the sulfur removal unit turnarounds were not included in the emission limitations.

(b) The basic RACT applied to all refineries was: 1) a sulfur removal unit/plant (SRU) that will remove 95% of the sulfur from the streams fed to it (Amine plant and sour water overhead stripper streams included), and for which routine maintenance turnarounds are restricted to the summer months; 2) a restriction on the burning of liquid fuel oil except during natural gas curtailments and/or as specified in the individual subsection of Section IX, Part H of the SIP, wherein a refinery could choose to burn this fuel but would need to trade-off the emissions equally (ton of SO_2 for ton of NO_x); and 3) a requirement for the use of Low-SO_x catalyst emission reduction techniques/procedures for fluid catalytic cracking units which would result in no more than 9.8 kg of SO_2 emitted per 1000 kg of coke burn-off (9.8 lb SO_2/1000 lb coke burn-off). Because the increase of sulfur content of the crude feed-stock now being experienced and expected to continue for the refineries, the State felt it was necessary to allow some flexibility by not requiring RACT controls/reductions on the NO_x sources. Thus, as the sulfur content in the crude increased, the refineries would be allowed to increase their SO_2 emissions by trading-off NO_x reductions from application of Lo-NO_x technologies, as approved by the Executive Secretary.

(c) Low-SO_x catalyst technology was considered RACT; however, a refinery could choose to trade-off NO_x emissions equivalent to that obtained by the 9.8 lb SO_2/1000 lb coke burn-off NSPS limit. Chevron USA choose to do this.

(d) No burning of liquid fuel oil was considered RACT, if it could be justified economically; however, a refinery could choose to trade-off the SO_2 by an increase of SRU efficiency or by applying NO_x controls. AMOCO may choose to do this.

(e) An allowance was made for AMOCO, Flying-J and Crysen because of their low process flaring emissions in comparison to those from Chevron and Phillips. Chevron's estimated flaring emissions (approx 250 tpy SO_2) were used as a basis and an amount was allowed for the three refineries as calculated using a feed through put ratio:

eg: $\frac{\text{AMOCO throughput (bbl/day)}}{\text{Chevron throughput (bbl/day)}} \times \text{Chevron flare } SO_2 \text{ emissions} = \text{allowance of } SO_2 \text{ for AMOCO}$

These ratioed amounts were then added to the three refinery SO_2 allowed emissions used for compliance.

(f) An allowance was made for Flying-J and Crysen using low sulfur content crude in their operation in comparison with AMOCO, Chevron and Phillips' average crude sulfur contents. Flying-J and Crysen were allowed to use AMOCO's estimated 1988 0.24% by weight sulfur content crude in the calculations of Post-SIP emissions for these two refineries.

IX.A.6.d. Solid Fuel Burning Devices:

Solid Fuel Burning Devices contribute a significant proportion to the PM_{10} concentrations in Davis, Salt Lake, and Utah Counties.

In 1987 the UACC adopted Subsection r307-1-4.13, UACR, Emissions Standards for Residential Solid Fuel Burners and Fireplaces, which established a limitation on the sulfur and volatile ash content of coal sold for direct space heating for residential solid fuel burners and fireplaces, and limited the emissions from these devices to 40% opacity as measured by EPA Method 9. As part of the development process of this SIP, the maximum opacity was changed to 20%. Although no credit will be claimed for these control strategies, its enforcement can help insure the proper operation of solid fuel burning devices.

The Bureau of Air Quality is proposing the initiation of a program beginning September 1, 1992, to control emissions from residential solid fuel burning devices which is detailed below. The BAQ will collect the data necessary to verify the effectivness of the program, and begin its information, public awareness, and public education programs before the program takes effect in 1992. The period from the promulgation of the program until the winter of 1992/1993 will also allow the BAQ the opportunity to implement and verify the proper functioning of the notification system that will be established and examine the potential of using a voluntary no-burn period to achieve the reductions in woodburning emissions required to meet the goals of this SIP. This interim period will also allow citizens who will be affected by the mandatory no-burn periods time to adjust their home heating requirements. Also, residents with sole source devices will be requested to certify these as such with the Executive Secretary or the appropriate local district health office.

(1) Emissions from wood burning devices account for 37.7 $\mu g/m^3$, which is equivalent to 14.3% of the PM_{10} concentrations at West Orem in Utah County. The following control strategies will be used to reduce emissions from wood burning devices in Utah County:

(a) Subsection R307-1-4.13.3, UACR establishes mandatory no burn periods (beginning September 1, 1992) for areas in Utah County which are north of the southernmost border of Payson City and east of State Route 68. The regulation establishes a mandatory no burn period when the ambient concentration of PM_{10} reaches 120 $\mu g/m^3$ as measured by the real-time monitor located at the Lindon monitoring site. During the mandatory no-burn period, citizens may not use any solid fuel burning devices or fireplaces except those which are registered with the Bureau of Air Quality or the local health district office as being the sole source of heat for the entire residence or which have no visible emissions. The no-burn period will be in effect until the Executive Secretary issues a statement declaring an end to the no-burn period.

(b) The City County Health Department of Utah County has committed itself to adopt local regulations which mirror those which are promulgated with this plan. The Board of County Commissioners of Utah County has adopted a resolution which supports the implementation of a woodburning control program in Utah County, and a copy of that resolution is contained in the technical support document. The regulations adopted by the City-County Health Department of Utah County will be formally adopted into this SIP after they have been formally submitted to the UACC.

(c) The Utah County Commission on Clean Air has submitted a plan which is incorportated by reference into this SIP and is contained in the Technical Support Document, and which proposes the following programs be established by appropriate local government agencies in Utah County:

(i) Banning of Coal Burning.

The county proposes a ban on all forms of residential coal burning within the County. This could result in a further decrease of 30%, or an additional 0.4 $\mu g/m^3$.

(ii) Installer and operator training programs for residential solid fuel burning devices.

A 5% reduction credit for this program is included in the "no-burn" period program.

(iii) Solid fuel burner inspection program.

A 5% reduction credit for this program is included in the "no-burn" period program.

(iv) Weatherization Requirements for Homes.

Allowable EPA credits for the implementation of requirements regarding the proper weatherization of homes has a maximum reduction of 5 percent. The state is claiming a 2% reduction in space heating emissions.

(v) All of the above strategies (a)-(d) are used as support for the adoption of the solid fuel burning device control strategy, and are used to justify the target 83% emission reduction credit claimed in this SIP.

(vi) In 2001, the actual effectiveness of the woodburning control program was evaluated by comparing PM_{10} filter data used in the original SIP to filter data collected during a 1996 episode of elevated PM_{10} concentrations. The 1996 filter data was run through an updated CMB modeling analysis to determine what portion of mass was attributable to woodsmoke. The 1996 apportionment was compared to the original apportionment analysis, and the observed decline in woodsmoke contribution was 83%. Thus, the program has been far more effective in reducing PM_{10} concentrations during episodes of elevated concentrations than was originally envisioned. This analysis is documented in Supplement II-02 of the Technical Support Document.

(2) Primary particulate emissions from solid fuel burning devices in the Salt Lake/Davis County area account for up to 27.0$\mu g/m^3$, which is equivalent to 16.03% of the PM_{10} concentrations in this area. The following control strategies will be used to reduce emissions from wood burning devices in the Salt Lake nonattainment area:

(a) Subsection R307-1-4.13.3, UACR, establishes mandatory no burn periods for all of Salt Lake County and for areas in Davis County which are south of the southern-most border of Kaysville when the ambient concentration of PM_{10} reaches 120 $\mu g/m^3$ and the forecasted weather includes a temperature inversion which is predicted to continue for at least 24 hours. During these mandatory no burn periods, it will be unlawful for individuals to use any solid fuel burning device or fireplaces except those which are registered with the Bureau of Air Quality or the local health district office as being the sole source of heat for the entire residence or devices and fireplaces having no visible emissions.

(b) Rules adopted by the Salt Lake City-County Board of Health and Davis County Board of Health which incorporate the regulations adopted by the State will be included into this SIP when they have been received from the county.

(3) The following control strategies will be implemented to reduce emissions from residential solid fuel burning devices in all PM_{10} nonattainment areas:

(a) Enforcement of the mandatory no burn period will involve an intensive effort from both the Bureau of Air Quality and the local health departments. During the mandatory no burn periods, 8 inspectors from the BAQ will conduct round-the-clock inspections. When a device or fireplace is observed burning, the inspectors may at reasonable times contact the individuals and inform them of the potential violation. The individuals using the fireplace or device may also be informed at that time of the BAQ penalty policy. The inspector will note the address of the observed burning devices or fireplaces. The following day the inspector will determine if the individuals who were burning the previous night are first time or repeat offenders and as soon as possible (within 24 hours), the inspector will implement the provisions of the penalty policy.

(b) The enforcement will also include the investigation of calls received at either the BAQ or the local health department. After a call is received, an inspector will visit the address of the suspected offender and verify if there is actually a violation of the mandatory no burn period. The individual will be contacted and notified of the possibility of penalties. The inspector will return to the office and determine if the individual is a first time or repeat offender and the inspector will implement the provisions of the penalty policy.

(c) Because the Bureau of Air Quality will have the primary responsibility to notify the public of the existence of a mandatory no burn period, the Bureau will reach an agreement by July 1, 1992 with the various news media to ensure that the public is informed of the mandatory no burn periods. A discussion of the media cooperation effort will be included in the technical support document when it is completed.

(d) To provide for a coordinated enforcement mechanism for the provisions of the mandatory no burn period, the Bureau will negotiate enforcement agreements by May 15, 1992, with the offices of the respective county sheriffs, the county fire marshals, the local fire departments, the local law enforcement agencies of each incorporated municipality, and the local city, county or district health departments.

(e) To strengthen the enforcement capabilities of the local health officers and alleviate any additional burden which penalization of those found in violation of the local county ordinances may have on the court system, the BAQ will work in cooperation with the local health officials to seek a statutory change to allow the assessment and collection of administrative penalties by the local health departments for woodburning violations.

(f) The implementation of the mandatory no burn period in Salt Lake County and the affected areas of Davis and Utah Counties by the BAQ and the local health department will result in a 60% decrease in emissions from wood burning devices.

(g) Beginning in the spring of 1992, the BAQ will concentrate on the development of a public awareness (PA) program. The program will be geared towards informing the public of the wood burning regulations, the proper installation and operation of solid fuel burning devices, the use of clean fuels, the health effects of wood burning, and the advantages of using a EPA Phase II certified stoves or natural gas. This PA program will be accomplished by using pamphlets, seminars, a booth at the State Fair, and having public discussions on the television and in the newspapers.

(h) The penalty policy which was adopted by the UACC in R446-4 of the Utah Air Conservation Regulations is used by the Executive Secretary to determine penalty amounts to be placed on air pollution sources for violations of the UACR. Category D. of this policy allows for up to $299 to be assessed against private citizens for non-compliance to the UACR, including the wood burning regulations.

The following guidelines will be followed for violations and penalty amounts:

Violation	Penalty/Violation
(i) First Violation.................	Assess Penalty $0 -$25 Issue a NOV
(ii) Second Violation	Assess Penalty $50 - $150 Issue a NOV
(iii) Third Violation.............	Assess Penalty $150 - $299 Issue NOV

Sites found with solid fuel burning devices and fireplaces operating illegally during a mandatory no-burn period will be reinspected within 24 hours and issued another notice of violation (NOV), if still not in compliance.

(4) Emissions from coal burning stoves can be significant. For example, they account for 0.03% or 0.08 $\mu g/m^3$ of the PM_{10} impact at the Lindon monitoring station. The mandatory no burn period will also preclude the use of coal burning stoves unless they are the sole source of heat, and after 1993,

the use of coal stoves will be precluded unless they are able to operate with no visible emissions. The mandatory no burn will result in an 83% reduction of the emissions from coal burning stoves, or 0.07 $\mu g/m^3$.

IX.A.6.e. PROVO CANYON CLOSURE TO TRUCK TRAFFIC

The Utah Department of Transportation (UDOT) is in the process of upgrading the Provo Canyon road into a four lane highway. The Provo Canyon Coalition is advocating that all non-destinational heavy duty truck traffic be banned from Provo Canyon. The coalition hired TRC Consultants to do a study of the situation. A copy of that study is contained in the Technical Support Document. Review of the study indicates that it is necessary to evaluate and consider this issue further before any action is taken by the UACC to recommend to the appropriate agency that they limit the use of the canyon by heavy duty diesel trucks. However, based on information currently available to the Committee, the Committee recommends that all non-destinational heavy duty truck which are on the interstate system should remain on the interstate system. The Committee also recommends at this time that the Utah Department of Transportation work with the Bureau of Air Quality to perform the necessary studies to determine the impact which heavy duty diesel truck traffic in Provo Canyon has on the air quality in Utah County and the impact which it would have were it moved to Salt Lake County.

IX.A.6.f. DIESEL INSPECTION AND MAINTENANCE PROGRAM AS ADOPTED

At the time of PM10 SIP proomulgation, the diesel I/M program was still in its conceptual stage. Subsequent negotiations on the national level between the California Air Resources board and the Trucking Association were instrumental in shaping the test procedures developed by the Society of Automotive Engineers and the diesel I/M program adopted by the Utah Air Quality Board. The anticipated "fine-tuning" of the program, as well as its relevance to the ozone program in Salt Lake and Davis Counties, makes it administratively more appropriate to structure the SIP to provide the diesel I/M program its own section. Thus, the details of the program as adopted by the Air Quality Board may now be found in Section XXI of the SIP.

IX.A.6.g. ROAD SALTING AND SANDING

Road salting and sanding and re-entrained road dust account for up to 17.4 $\mu g/m^3$ of the observed PM_{10} concentrations in Utah County on the design day and up to 13.4 Fg/m^3 at the Salt Lake nonattainment Area monitors. The controlling of road salting/sanding has been reviewed as a source of PM_{10} emissions reductions. The Utah Air Conservation Regulations were changed as a part of the development of this plan to limit the application of de-icing/deslicking material on roads in any PM_{10} nonattainment area to salt containing no more than 2% insoluble solids and the application of sand or crushed slag of which no more than 10% could pass through a #16 mesh, which contained no more that 3% fines, and had a Vicker's Hardness of 1000+. This regulation was predicted to reduce the emissions from road dust and road salting and sanding by 20%.

In response to comments received at the public hearings for this SIP, it was determined that it was essential for the State to gather more information in order to confirm the 20% reduction. The proposed rule was changed to eliminate the limitations on salt/sand/slag applied during the winter of 1991-1992, although it still required that records of the amount and type of material applied be maintained and made available to the Executive Secretary. During the late fall and early winter of

1990 and in the early winter of 1991/1992, EPA and the State committed to fund a study whereby data would be collected to determine the background concentrations of re-intrained road dust and the amount of salt/grit left on the road system after application to verify the 20% reduction claim.

With the study still pending it was agreed that, within 6 months of the completion of the study, all agencies responsible for the application of salt, sand, or other deslicking grit to any roadway in a PM_{10} nonattainment area would submit to the UACC for its approval and incorportation into this SIP a plan and implementation schedule which would establish methods which would be used to reduce initial street loading of particulate matter by 25% from the amount applied during the 1989 base year, e.g., by using sand containing a lower percentage of fine material, using more durable grit or sand material, applying street cleaning methods, being more restrictive on the amount of material applied, or any other method aproved by the UACC. Those methods included in the Plan were to have been implemented within 6 months of the submittal of the plan, but no latter than October 1, 1993.

As a result of the study, the use of salt that is at least 92% sodium chloride has been determined to be Reasonably Available Control Technology for salting, and R307-1-3.2.7 has been revised to require that anyone using any other substance must either demonstrate that the material contributes no more PM10 emissions than salt that is at least 92% sodium chloride, or must vacuum sweep every arterial roadway to which the material was applied within three days of the end of the storm. The rule as revised no longer requires the submittal of a plan and schedule to reduce street loading of particulatematter by 25%, nor does it require an annual submittal of verification of compliance.

As authorized by Section 19-2-104 of the Utah Code, and as the enforcement mechanism of this regulation, the BAQ will require the maintenance of records of the material applied by those who are responsible for the application of salt/sand/grit to the road system. For salt, the records will include the quantity applied, the percent by weight of insoluble solids in the salt, and the percentage of the material that is sodium chloride (NaCl). For sand or crushed slag the records will include the quantity applied and the percent by weight of fine material which passes the number 200 sieve in a standard gradation analysis. All records must be maintained for a period of at least two years, and the records shall be made available to the Executive Secretary upon request.

IX.A.6.h ROAD SALTING AND SANDING (Utah County, 2002)

Road salting and sanding and re-entrained road dust account for up to 18.2 $\mu g/m^3$ of the observed PM_{10} concentrations in Utah County on the design day. On February 3, 1995, Utah submitted amendments to the PM_{10} SIP to add specifics of the road salting and sanding program promised as a control measure in the PM_{10} SIP. EPA published approval of the road salting and sanding provisions on December 6, 1999 (64 FR 68031), thus acknowledging that the rule had achieved the 20% target.

IX.A.7 MAINTENANCE

The preceding demonstrations have shown that the PM_{10} NAAQS will be achieved no later than December 31, 1993. Having once attained the standards it is necessary to maintain ambient PM_{10} concentrations below the standards in order to protect the health of the citizens living in these areas. Eliminating the impact of growth on PM_{10} concentrations is the key to maintaining the PM_{10} NAAQS. Anticipating the areas where growth will occur is difficult and uncertain. The areas where it is anticipated that growth will occur are population; vehicle miles traveled (VMT); home heating; commercial heating; and industrial.

IX.A.7.a Population is projected to grow at 1.5% per year.

(1) Home heating natural gas furnaces. The growth in natural gas home heating will result in an increase of 1.2 tons/year in PM_{10}, SO_2, and NO_x. A Utah County proposal to establish building code requirements for additional weatherization will reduce the anticipated impact in that county.

(2) Fireplace and wood stove growth. New home construction is 1.5% per year. Information from building permits indicate that 65% to 70% of new homes are constructed with a fireplace or wood stove. An additional 15% to 20% are constructed with the foundation and keyway inplace for a fireplace to be added later. The results of the woodburning surveys in Lindon and Salt Lake indicate that > 30% of those who have wood burning devices are serious woodburners. Most serious wood burners use wood stoves. Federal law prohibits the sale of non-certified stoves after July 1, 1990. The mandatory no burn requirement will restrict the impact of new wood stoves. The exemption that allows only the use of wood stoves and fireplaces with no visible emissions during the mandatory no-burn periods will further limit the increase in woodburning emissions. It is anticipated that the increase in emissions which will occur from the increased number of fireplaces and wood stoves is only 0.2% or 1.2 tons per year.

IX.A.7.b. The vehicle fleet is growing at about 4.5% per year. This growth is also reflected in the increase in vehicle miles traveled and is important to the extent that it identifies the rate at which newer, less polluting vehicles are replacing older, more polluting vehicles.

IX.A.7.c. The number of vehicle miles traveled is projected to increase at a rate of 15% in 5 years. This is a little less than 3% per year. NO_x emissions from automobiles are a major source of secondary PM_{10} in all PM_{10} nonattainment areas. To maintain the PM_{10} standard once it is attained, definite maintenance strategies for automobile emissions must be implemented. There are two possible ways to reduce No_x emissions from automobiles. One method is to reduce the number of vehicle miles traveled (VMTs) and the other method is to actually reduce NO_x emissions from automobile exhaust. Below is a list of the strategies that were evaluated in detail by contacting other state, city and county officials, EPA technical support staff, and evaluating published data on the various strategies. Details on each of the proposed strategies are contained in the technical support document.

The Bureau of Air Quality will consider the recommendations made by the Governor's Clean Air Commission and, in coordination with the local health and planning agencies of the counties along the Wasatch Front, select the most promising and effective strategies to reduce travel related air emissions from those listed below. Those selected strategies will be proposed, legislative action sought as needed, and the appropriate rulemaking completed. This effort began during the summer of 1990 with the goal of obtaining initial legislative action during the CY1991 session and will continue during subsequent sessions of the legislature.

(1) POSSIBLE METHODS TO REDUCE VMTS

PARKING MANAGEMENT:

growth ceilings
increased parking fees

MASS TRANSIT:

bus
light rail system

EMPLOYER-BASED TRAVEL REDUCTION PROGRAMS:

vanpools
flextime
other

NO-DRIVE DAYS:
voluntary
mandatory
only during inversions

BYPASS LANES DURING RUSH HOUR FOR:
bus transit system
carpools
high occupancy vehicles

ENHANCE AND ADVERTIZE THE EXISTING:
bus transit system
ridesharing
park-n-rides
bicycle lanes

IMPROVED LAND-USE PLANNING

GASOLINE RATIONING

(2) POSSIBLE METHODS TO REDUCE NO_x EMISSIONS FROM VEHICLES

ALTERNATIVE FUELS:
implemented for reduction of CO during winter months
many increase NO_x emissions
cng
propane
electric
oxygenated fuels
methanol - ethanol - reformulated gas (mtbe)

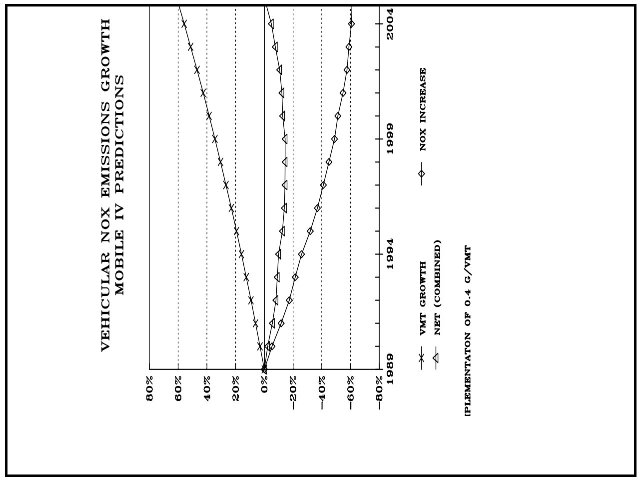
REQUIRE USE OF ALTERNATIVE FUELS BY:
public
bus transit system
fleets

IMPROVE TRAFFIC FLOWS:
synchronize lights
maintain continuous flows on interstate
REQUIRE ADDITIONAL NO_x CONTROLS ON VEHICLES:
three-way catalyst converters installed since 1981
retrofitting older cars not feasible

IMPLEMENT NO_x I/M PROGRAM:
additional equipment very costly
NO_x emissions remain constant

IMPLEMENT PROPOSED CLEAN AIR ACT NO_x STANDARD OF 0.4 GPM EARLIER THAN 1993

ADOPT AND IMPLEMENT CALIFORNIA'S PROPOSED NO_x STANDARD OF 0.2 GPM



(3) It appears that the following proposed maintenance strategy can be implemented without legislative approval which will furnish considerable reduction credits - the Clean Air Act Amendments of 1990 change the existing 1.0 grams/vehicle mile traveled (g/vmt) No_x standard to 0.4 g/vmt, which represents a 60% reduction in vehicle emissions for light duty vehicles which can be claimed by the state as a reduction credit. This Clean Air Act requires cars manufactured after 1994 to meet the more stringent NO_x standard. With cleaner vehicles replacing older more polluting vehicles at a rate of 4.5% per year improvement should continue through the 18 year replacement cycle (i.e., until the year 2012). If analysis of the program and its impact on vehicular emissions indicates that the required emission reductions are not being realized, then the State will evaluate the options to gain the necessary reduction to meet the standard. Figure IX.A.21 shows the impact this proposal will have on vehicular NO_x emissions in the State.

IX.A.7.d. The Utah Department of Transportation and local planning agencies will be requested to cooperate and to review all proposed construction projects for any impact the proposed construction projects will have on the PM_{10} NAAQS and on the strategies included in this PM_{10} SIP as well as those for Ozone and carbon monoxide. Impacts on PM_{10} concentrations should be reviewed and mitigative steps stipulated as part of the planning process.

IX.A.7.e. EPA has promulgated federal standards for diesel fuel. The standard for sulfur is .05% sulfur content of diesel fuel, and is effective in 1993. This is significantly lower than the 0.43% average sulfur content presently in diesel fuel. A standard of 40 C-tane has also been proposed. The implementation of these programs will result in an additional reduction of PM_{10} emissions from diesel engines and will contribute to maintenance of the PM_{10} NAAQS.

IX.A.7.f. EPA has promulgated a federal emission standard for diesel transit bus engines for 1991 and later engines and for heavy duty (8,500 pounds gross vehicle weight and heavier) truck engines for 1994 and later engines. The new diesel emission standards reduce primary PM_{10} particulate emissions by 80% and will reduce NO_x emissions by 50%.

The normal replacement rate for Utah Transit Authority (UTA) buses is 1/12 of their fleet per year. Since a large purchase of 204 buses was made in 1976 and those buses are wearing out, UTA is planning to replace and purchase a number of buses beginning with a replacement of 112 buses in 1990 and plan to replace more buses in 1993 and more in 1998. Beginning in 1991 the normal bus replacement rate will result in a 7% per year reduction in PM_{10} emissions and a 4% per year reduction in NO_x. Documentation from UTA is contained in the technical support document.

The normal replacement rate for truck tractors in the trucking fleet is 20% per year. Beginning in 1994 the new emission standard will result in a 16% per year reduction in PM_{10}

emissions for 5 years. The NO_x emissions from diesel trucks will be reduced 10% per year for 5 years. The reduction in PM_{10} emissions from replacement of bus and heavy duty truck engines will contribute to maintenance of the PM_{10} NAAQS. In addition, UTA is purchasing five compressed natural gas buses to research methods of meeting the PM_{10} emission standard.

IX.A.7.g. Commercial growth should follow population growth at 1.5% per year. Local planning agencies are required to review construction projects to assure that the projects are consistent with the SIP and do not create new problem areas or cause a negative impact on an existing problem. Any identified impacts must be mitigated. Since most of the emissions associated with commercial development is associated with boilers or burners for space heating, the emission offset and low NO_x burner requirements will have to be met.

IX.A.7.h. Projected industrial growth is unknown. The PM_{10} standards will be maintained in the PM_{10} group I areas by implementing the following strategies:

(1) Emissions Capping: All sources in existence at the time of the development of this SIP having existing approval orders have been issued new limitations on the emissions of PM_{10}, SO_2, and NO_x. An upper emissions cap has been established for existing industrial sources located in or impacting PM_{10} nonattainment areas.

(2) Emissions Offset: As the population of the valley grows, there are many small sources of NO_x and other PM_{10} matter which will grow without control (i.e., home space heating, space heating of offices, very small boilers, etc.) As a method of verifying that the emissions invenotory stabilizes, any new or modified source located in or impacting the nonattainment areas which emits 25 tons/year or more but less than 50 tons/year of any combination of PM_{10}, SO_2, or NO_x will be required to obtain a 1:1 emission offset credit as a condition of the approval order from the UACC. New or modified sources located in or impacting the nonattainment area which emit 50 tons/year or more of any combination of these pollutants will be required to obtain a 1.2:1 emission offset credit prior to the issuance of an approval order. The result of the offset requirement is that industrial growth will not increase the cap on industrial emissions and a net reduction occurs when larger industries locate in or near the nonattainment areas.

(3) As a minimum, low NO_x burners or whatever is determined to be BACT at the time of proposed construction or modification are required on all new construction. Whenever burners are replaced, low NO_x burners or whatever is determined to be BACT at the time of replacement are required when the replacement can be installed without significant physical changes having to be made on existing process equipment. The result of this requirement will be that new burners will emit 40% to 60% less NO_x than otherwise would be allowed and a 40% to 60% reduction of NO_x emissions will occur when industrial or commercial burners are replaced. The amount of reduction is dependent on the size of the burner being replaced. In addition, if a new burner emits more than 25 tons/year of NO_x, offset of those emissions must be obtained as a condition of the approval order as required in (b) above.

IX.A.7.i Utah County 2002

With this revision to the PM_{10} SIP, the Utah Air Quality Board commits to developing a PM_{10} maintenance plan or SIP revision, as appropriate, based on dispersion modeling.

IX.A.8 CONTINGENCY MEASURES

IX.A.8.a. Attainment Date

In accordance with Section 172(c)(9) of the Clean Air Act, any implementation plan for a nonattainment area must contain contingency measures to be undertaken if the area fails to make reasonable further progress (RFP), or to attain the national primary ambient air quality standard by the applicable attainment date. Such measures are to be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator. Section 172(c)(9) does not specify the number of contingency measures to be adopted or the magnitude of the emission reductions to be achieved.

Both Utah County and Salt Lake County are classified as "moderate" nonattainment areas under Section 107(d) of the Clean Air Act, and therefore the attainment date is December 31, 1994.

Under Section 189(c) of the Clean Air Act, plan revisions demonstrating attainment in PM10 nonattainment areas must contain quantitative milestones which are to be achieved every three years until the area is redesignated to attainment, and which demonstrate reasonable further progress (RFP) toward attainment by the applicable date. Because the starting date for counting the three-year interval was inadvertently omitted from the statute, EPA was left to exercise its discretion and chose as this starting point the due date for the applicable SIP revision. For moderate nonattainment areas this date was November 15, 1991. Thus, the first quantitative milestone deadline for the initial PM10 moderate nonattainment areas is November 15, 1994. The attainment date for initial PM10 moderate areas is December 31, 1994. This de minimis timing differential makes it administratively impracticable to require separate milestone and attainment demonstrations. Thus, the emissions reductions progress made between the SIP submittal due date and the attainment date will satisfy the first quantitative milestone requirement for these areas. The second milestone would occur on November 15, 1997.

To demonstrate attainment, a state must show that the primary standard for PM10 is exceeded no more than three times within a three-year period. Therefore, it is necessary to evaluate the three years preceding the attainment date in order to make such a determination. However, because the statutory due date for implementation of all reasonably available control measures required by the plan revision (CAA Section 189 (a)(C)) is not until December 10, 1993, it would be logical to assume that the three year period used for evaluation (calendar years 1992, 1993 and 1994) would contain only one "clean" year of ambient monitoring data. Therefore, in Section 188(d) EPA has allowed the states to request up to two "extension years" (one at a time) to the attainment date provided that: 1) all SIP measures are in place, 2) in the year preceding the proposed extension year there was no more than one exceedance of the 24-hour standard, and 3) the annual mean concentration for that year was less than or equal to the national standard. This procedure effectively rolls forward the three-year period used to evaluate whether an area has or has not attained the standard, replacing the oldest year with a new year which presumably shows the effect of RACT controls. Therefore, Utah's attainment date may be December 31, 1994, or December 31, 1995 if one extension is granted, or December 31, 1996 if two extensions are granted.

On 18 June 2001, EPA published a finding (66 FR 32752) that Salt Lake County had attained the NAAQS by 31 December 1995 and Utah County had attained the NAAQS by 31 December 1996. That notice also stated that both areas had demonstrated Reasonable Further Progress as required in the Act (66 FR 32752-754). A letter from EPA Region VIII to the Division of Air Quality dated October 6, 2000 stated that, "In an October 6, 1995 memorandum from Joe Paisie of OAQPS to the EPA regional offices, it was explained that if a PM_{10} nonattainment area has attained the standard with at least 3 years of clean air quality data, and as long as that area continues to attain the standard, the section 172(c)(9) contingency measure requirement will not apply." Therefore, with eight years of clean air quality data, Utah is not required to submit contingency measures in this SIP. Copies of the Joe Paisie memorandum and the October 6, 2000 letter from EPA to UDAQ are contained in Supplement II-02 of the TSD.

IX.A.9 ANNUAL AVERAGE

DEMONSTRATION OF ATTAINMENT OF THE ANNUAL AVERAGE

In addition to demonstrating that the 24 Hr. average attains the NAAQS, the SIP must also demonstrate that the annual arithmetic mean meets the NAAQS of 50 $\mu g/m^3$.

Utah County

The highest annual average PM_{10} concentration over the past two years in Utah County is 54 $\mu g/m^3$ for 1988 at Lindon. This results in a required reduction of the annual average of 7.4% in Utah County. On page 6-1, the "PM_{10} SIP Development Guideline" states:

> "The SIP-related emission limits should be based on the NAAQS (annual or 24-hour) which result in the most stringent control requirements. For example, if the annual NAAQS requires more stringent control requirements than the 24-hour NAAQS, the annual NAAQS is considered the more restrictive standard and the corresponding emission limit(s) would be adopted."

Since the 24-hour design values result in a reduction of 43% in Utah County, the 24-hour emission limits are the more restrictive.

The application of many of the control strategies that are being implemented to reduce the 24-hour PM_{10} concentrations will also result in a reduction of the annual PM_{10} concentrations even though they are designed to reduce winter time 24-hour concentrations. Table 9.A.26 shows that the winter season is the period that has the greatest impact on the annual average and controlling PM_{10} concentrations during the winter will have the greatest impact on the annual average.

Design values in Utah County ranged from 191 $\mu g/m^3$ to 264 $\mu g/m^3$. Thus, the control strategy necessary to achieve the 24-hr NAAQS at all stations effectively ranges from 27% to 43%. Even the minimum of this range is well in excess of the 7.4% necessary to bring the maximum observed annual concentration back down to the level of the annual standard. The annual NAAQS for PM_{10} was never violated in Utah County.

1988 (NON-WINTER)	LINDON	WEST OREM	NORTH PROVO
MAR	31		22
APRIL	35		24
MAY	32		31
JUNE	41		25
JULY	47		46
AUG	39		35
SEPT	49		36
OCT	47	34	30
AVG NON-WINTER	40.1		31.1

1988 (WINTER)	LINDON	WEST OREM	NORTH PROVO
JAN	103		75
FEB	98		80
NOV	32	31	23
DEC	96	81	89
AVG WINTER	82.3	56.0	66.8
ANNUAL AVG	54	54	50

1989 (NON-WINTER)			
MAR	39	40	40
APRIL	31	34	29
MAY	32	34	30
JUNE	27	28	29
JULY	39	35	28
AUG	35	29	28
SEPT	35	31	34
OCT	31	29	27
AVG NON-WINTER	33.6	32.5	30.6

1989 (WINTER)			
JAN	119	117	109
FEB	116	122	62
NOV	52	51	42
DEC	75	73	61
AVG WINTER	90.5	90.8	68.5
ANNUAL AVG	52	49	44

Table IX.A.26

Salt Lake - Davis Counties

The highest annual average PM_{10} concentration over the past two years in the Salt Lake - Davis County area is 56 $\mu g/m^3$ for October, 1988, through September, 1989, at the North Salt Lake monitor. This results in a required reduction of the annual average of 10.7 % in Salt Lake County. As stated above, the "PM_{10} SIP Development Guideline" states:

> "The SIP-related emission limits should be based on the NAAQS (annual or 24-hour) which result in the most stringent control requirements. For example, if the annual NAAQS requires more stringent control requirements than the 24-hour NAAQS, the annual NAAQS is considered the more restrictive standard and the corresponding emission limit(s) would be adopted."

Since the 24-hour design values result in a reduction of 19.6% in the Salt Lake - Davis County area, the 24-hour emission limits are the more restrictive.

The application of many of the control strategies that are being implemented to reduce the 24-hour PM_{10} concentrations will also result in a reduction of the annual PM_{10} concentrations even though they are designed to reduce winter time 24-hour concentrations. Table IX.A.25 shows that the winter season is the period that has the greatest impact on the annual average and controlling PM_{10} concentrations during the winter will have the greatest impact on the annual average.

As shown in Tables IX.A.17, IX.A.18, and IX.A.19 (attainment demonstration, AMC), the control strategies that will be implemented in Salt Lake County will reduce the winter time 24 Hr. PM_{10} concentrations by 19.6%. Those strategies implement control measures which will reduce PM_{10} concentrations throughout the entire year by 16.9 to 18.6%. The control measures identified in the SIP to reduce 24-hour PM_{10} concentrations during the winter will result in a reduction of 22.5 Fg/m^3 in the annual average, and result in a predicted annual average of 33.5 Fg/m^3 (56-22.5). Additional control requirements have been put into place which will reduce PM_{10} emissions from industrial sources that operate only during the summer. Those controls include a reduced opacity limit on combustion and process sources, increased watering and control requirements on stockpiles and fugitive dust sources and a higher moisture content in process material. In addition more restrictive emission limits have been placed on SO_2 and NO_2 emissions from asphalt batch plants in the North Salt Lake and Beck Street areas which are very near the North Salt Lake PM_{10} monitoring station. Those summer controls in conjunction with the winter control measures for PM_{10} will result in an annual average below the annual NAAQS of 50 $\mu g/m^3$.

1988 (NON-WINTER)	AMC	NSL	SLC	CW	MG
MAR	35	32	34		
APRIL	42	25	42		
MAY	44	30	31		
JUNE	49	38	36		
JULY	51	36	39	45	
AUG	53	36	39	40	
SEPT	56	57	39	39	
OCT	66	46	28	31	
AVG NON-WINTER	49.5	38.6	36.0	37.2	
1988 (WINTER)					
JAN	69	72	43		
FEB	70	66	50		
NOV	34	31	25	19	
DEC	80	79	77	48	
AVG WINTER	63.3	62.0	51.0	40.0	
ANNUAL AVG	54	49	41	38	
1989 (NON-WINTER)					
	AMC	NSL	SLC	CW	MG
MAR	51	43	34	34	25
APRIL	32	46	26	29	24
MAY	33	42	26	28	21
JUNE	27	29	26	36	19
JULY	37	51	32	41	29
AUG	37	47	26	44	25
SEPT	37	54	31		29
OCT	36	58	29		25
AVERAGE OF NON-WINTER MONTHS	36.3	46.2	28.8	35.3	24.6
1989 (WINTER)					
JAN	91	75	99	105	47
FEB	100	79	83	68	56
NOV	59	64	42		34
DEC	83	80	78	87	47
AVG (WINTER)	83.3	74.5	75.5	86.6	46.0
ANNUAL AVG	51	56	41	55	31
1990 (NON-WINTER)					
	AMC	NSL	SLC	CW	MG
MAR	33	36	25	27	21
APRIL	26	35	20	20	20
MAY	29	35	21	21	16
JUNE	31	40	22	22	20
JULY	35	46	26	45	25
AUGUST	35	53	33	40	29
SEPTEMBER	31	49	28	39	24
AVG NON-WINTER	31.4	42.0	25.0	25.6	22.1
1990 (WINTER)					
JAN	55	55	42	37	29
FEB	50	39	43	28	
AVG WINTER	52.5	52.5	40.5	40.0	28.5

Table IX.A.27

IX.A.10 TRANSPORTATION CONFORMITY

For purposes of Transportation Conformity as established by Section 176(c)(2)(A) of the Clean Air Act, Table IX.A.28 identifies the mobile source budget for 2003 and the two horizon years used in transportation planning, 2010 and 2020 for Utah County:

Year	Tons/Winter Day	
	Primary PM	**NO_x**
2003	6.57	20.35
2010	7.74	12.75
2020	10.34	5.12

TABLE IX.A.28

The values for 2003 reflect the inventory values for mobile sources that were used in the CMB modeling. The CMB modeling, based on these inventory values and inventory values for other source categories, demonstrates attainment in 2003.

The inventory values are shown in Table IX.A.3. The CMB modeling results are shown in Tables IX.A.5.a and b, IX.A.7.a and b, and IX.A.9.a and b.

For 2010 and 2020, inventory values for all source categories were projected forward, based on appropriate growth assumptions. The 2010 and 2020 mobile source emissions budgets reflect the mobile source inventory values in 2010 and 2020, except that "road dust" and "brake wear" portions of the 2020 mobile source inventory were expanded by 7% to take advantage of part of the available safety margin in that year. More specifically, even using these expanded mobile source emissions, the CMB projections for 2020 show a maximum concentration of 147.2 ug/m3. Documentation for the assumptions used to establish these budgets and for the modeling used to make this demonstration of attainment is all contained in Supplement II-02 of the Technical Support Document (TSD).

The motor vehicle inventory values were developed by the Mountainland Association of Governments (MAG) based on MOBILE6, PART5, and current projections of the Vehicle Miles Traveled (VMT) in Utah County. The modeling analysis included the most recent planning assumptions concerning point, area, and mobile sources.

MAG is required to develop Long Range Plans that go out well beyond 2020, and to demonstrate conformity to the 2020 budget for all years beyond 2020. Also contained in Supplement II-02 of the TSD is a discussion of possible control strategies that might be employed by MAG to meet these budgets after 2020.